Uncommon Sense

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Vol.1 TO BE

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Volume 1: to be

Feeding, Moving, and Aging a Body Nobody Gave You a Manual For

Nobody hands you a manual when you're born. Instead you absorb thousands of confident-sounding rules by osmosis — from your parents, your school, the back of a cereal box — about when to eat, how to sleep, what your BMI means, and how fast you're supposed to fall apart once you hit fifty. Almost none of it came from biology. Most of it came from a factory floor, an ad agency, or a man with something to sell. This part puts the body you're currently operating up against its actual warranty.

Chapter 1. Three Squares a Day

> "Eat breakfast like a king, lunch like a prince, and dinner like a pauper." [1]
> *— Adelle Davis,[2] nutritionist, 1954*
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> "Anyone who manages an overnight fast of more than twelve hours is doing well." [3]
> *— Dr. Michael Mosley, physician*

Your stomach cannot tell time. It's never seen a clock, doesn't know what "noon" means, and has no opinion on whether this is technically breakfast, lunch, or a Tuesday. And yet, at roughly midday, tens of millions of people who felt perfectly fine at 11:47 suddenly get hungry, together, on cue. That's not biology. That's a bell that used to hang outside a factory, still ringing in your head a century and a half later.

The claim, stated the way everyone states it: humans need three meals a day, spaced roughly morning, midday, and evening, and skipping one is a small act of bodily self-sabotage — your metabolism will "slow down," your blood sugar will do something ominous, you'll be useless by 3 p.m. Ask anyone to name the actual mechanism and you get a shrug wearing a lab coat.[4]

A Tale of Two Families

Here's what actually happened, and it depends enormously on which family you're asking.

A hunter-gatherer household's day ran on luck, not a clock. A successful hunt meant a real feast, shared across the whole camp that same day, since nobody had a refrigerator to save it for later. A bad hunting day meant falling back on whatever the group's foragers — often the women and children — had gathered that morning: fruit, tubers, shellfish, insects, whatever the land offered, eaten on the spot, because nobody was carrying a lunchbox. That produced something closer to steady grazing punctuated by the occasional windfall than three sit-down meals. Counterintuitively, this turns out to have been the more famine-resistant way to live:[5] researchers comparing subsistence societies have found hunter-gatherers experienced measurably less frequent and less severe famine than early farmers did, mostly because a

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[1] Popik, Barry. "Eat Breakfast Like a King, Lunch Like a Prince, and Dinner Like a Pauper." *The Big Apple* (blog), July 12, 2019.
[2] "Adelle Davis." *Wikipedia*.
[3] "Dr Michael Mosley's Breakfast Rule — and Whether It Helps with Weight Loss." *Surrey Live*, December 3, 2024.
[4] "When Did People Start Eating Three Meals a Day?" *History Facts*, October 10, 2024.
[5] "Hunter–Gatherers Have Less Famine than Agriculturalists." *Biology Letters*, via *PMC*.

forager having a bad week could simply walk somewhere else, while a farmer watching a crop fail was stuck watching it fail.

A farming family's day, by contrast, ran on daylight and the granary. Agriculture, starting around 10,000 BCE, introduced something genuinely new: stored food, which finally made meals predictable instead of opportunistic. But "predictable" didn't mean three meals on the hour — it meant a rhythm built around sunrise-to-sunset field labor. Something substantial before heading into the fields at dawn, a bite near the field around midday, and the real meal of the day once the work and the light both ran out. That basic shape — light start, working middle, substantial end — shows up independently in farming societies on nearly every continent, which is a much better clue that everyone shared the same daylight and the same labor logistics than that everyone shares some deep biological need for exactly three meals.[1]

The Global Tour

Rome fits this same pattern: the Romans mostly ate one real meal, around midday, and treated a second hearty sitting as a bit self-indulgent — the ancient equivalent of ordering a second dessert. For centuries afterward, up until around 1800, most English households — and the American households descended from them — ate two meals, not three. Breakfast, when it existed at all, was often just bread and small beer, assuming you bothered.

Turns out England wasn't even being original. Look almost anywhere else in the ancient world and a strikingly similar shape keeps showing up, arrived at completely independently. Most ancient Egyptians, rich and poor alike, ate two meals — bread and beer in the morning, a heartier spread of vegetables and meat at night.[2] From the Shang dynasty through the Han, most people in China also ate two, called *yongshi* (morning) and *sunshi* (late afternoon);[3] eating between them was considered bad manners, and the etiquette ran so deep that Qing emperors were still publicly boasting about their frugal "two meals a day" centuries later — Emperor Kangxi even lectured his officials about it — even as palace records show him quietly snacking before dawn and adding a fourth meal most evenings.[4] Traditional Ayurvedic texts from ancient India likewise describe two meals as the ideal, with the midday meal treated as the largest,[5] timed to when the body's digestive "fire" was believed to run hottest — and built directly into that tradition was regular, planned fasting, observed roughly twice a month by the Hindu

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[1] "Order and Disorder: Temporal Organization of Eating." PMC, National Center for Biotechnology Information. https://pmc.ncbi.nlm.nih.gov/articles/PMC3424484/.

[2] "The Diet of the Nile: What Did the Ancient Egyptians Eat?" *History Hit*, January 28, 2020.

[3] "Unveiling the Historical Stories Behind Chinese Morning Meals." *Newhanfu*, February 4, 2026.

[4] "The Curious Culinary Habits of China's Imperial Courts: From Frugality to Feasting." *Ancient War History*, August 1, 2025.

[5] "Eat Meals At Fixed Times: Ayurveda Tips for Self Care." *Ayurooms*, May 6, 2023.

calendar, not as an extreme measure but as an entirely ordinary part of religious life.[1] Forager-horticulturalist societies in places like the Amazon basin tend to land closer to the hunter-gatherer pattern above: a starchy staple crop plus whatever the day's fishing or hunting produces, eaten opportunistically rather than on any fixed schedule.[2]

None of these cultures were in contact with each other when they each arrived at some version of "one or two meals, with the biggest one substantial." What they're a much stronger argument for is that the human body copes fine with a wide range of eating patterns — and that the specific modern invention of three roughly equal, clock-timed meals plus snacks in between is the actual historical outlier, not the default everyone else was too primitive to figure out.

Where "Three Squares" Comes From

Three *squares* a day is a genuinely recent invention, and the word choice might not be a coincidence: some food historians trace "square meal" to the British Navy, which served sailors from square wooden trays and ran one of the first strict three-meals-on-a-schedule operations in Western history — because you cannot run a warship on eight hundred stomachs eating whenever they personally feel like it. Land-based society caught up a couple of centuries later, for almost the identical reason. The Industrial Revolution pulled workers and children out of farmhouses, where you eat when the harvest allows, and into factories and schools, which run on bells. Lunch — a word that barely meant a full meal before the 1800s — got invented almost by necessity, as the thing that fills the gap between a factory whistle in the morning and another one at night.[3]

The Manufactured Breakfast

Breakfast had its own, weirder journey. Heavy physical farm labor justifies a genuinely large morning meal; desk work and city living, less so — and by the early 1900s the typical American breakfast had shrunk to a roll, maybe some oatmeal, a cup of coffee. Then, within about a decade, two separate industries independently decided breakfast needed saving, for two completely different reasons. In Battle Creek, Michigan, a Seventh-day Adventist physician named John Harvey Kellogg had spent years developing a bland, easily digestible cereal as part of a strict health philosophy; his brother Will later added sugar, built an advertising empire, and turned "eat cereal for breakfast" into one of the most successful marketing stories in American history. Meanwhile, in the 1920s, the era's leading public-relations man, Edward Bernays, was hired by a pork company sitting on unsold bacon. Bernays didn't run an ad. He had his agency's

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[1] "Intermittent Fasting - India's Ancient Custom Is a Rage Today." *Center for Soft Power*, March 4, 2021.
[2] Douillard, John. "Studies on Amazonian Tsimane Diet Show Longevity Benefits." *LifeSpa*, October 28, 2021.
[3] "Why Do Americans Eat Three Meals a Day?" *JSTOR Daily*, December 16, 2019.

in-house doctor ask several thousand physicians whether a "hearty breakfast" was healthier than a light one, then released their answer to newspapers as though it were simply news: doctors agree, big breakfast, more energy. Bacon sales climbed back to where they'd been decades earlier. A nation's morning plate had just been redesigned, twice, by people who were not, primarily, in the business of nutrition.[1]

One slightly oversold piece of history goes further: the famous claim that Kellogg invented corn flakes *specifically* to stop people from masturbating — the company did prescribe bland "unstimulating" food generally to dampen "the passions,"[2] but by most careful accounts never marketed the cereal on that basis specifically.[3]

Here's the pattern worth watching for, because it repeats constantly: an accident of institutional scheduling — a navy's logistics, a factory's shift bell — teams up with an accident of commerce, until the result feels less like two unrelated conveniences and more like an immutable law of human biology. Nobody designed the three-meal day for your benefit. It assembled itself out of other people's logistics and other people's ad budgets, and got handed down to you dressed up as instinct.

The Modern Biohack, Fact-Checked

Which brings the story back around to the present, because the "two meals, biggest one substantial" pattern that Egypt, China, and India each landed on independently is more or less what gets marketed today as a cutting-edge biohack. Sixteen-eight — eating within an eight-hour window and fasting the other sixteen — is essentially the Han dynasty schedule with an app. And the actual research on it is considerably less settled than either its fans or its critics tend to let on. Several rigorous trials do show real improvements in blood sugar, cholesterol, and inflammation. [4]

Unfortunately nutrition research as a field has a well-documented industry-funding problem worth flagging on principle: one analysis found studies funded exclusively by food and beverage companies were 4–8 times more likely to reach conclusions favoring the sponsor, [5] [6] and a

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[1] "Bacon, Eggs, and Public Relations: How PR Pioneer Edward L. Bernays Changed America." *This Is Capitalism*, October 24, 2023.

[2] “Plain Facts for Old and Young: Embracing the Natural History and Hygiene of Organic Life”, published 1877 by Kellogg.

[3] "The History of Corn Flakes Is Even Worse Than You Knew." *The Takeout*, February 18, 2025.

[4] "Time-Restricted Eating in Metabolic and Clinical Health: A Current Evidence and Mechanistic Insights." *ScienceDirect*, December 30, 2025.

[5] Lesser, Lenard I., et al "Relationship Between Funding Source and Conclusion Among Nutrition-Related Scientific Articles." *PLoS Medicine* 4, no. 1 (2007): e5.

[6] "Navigating Industry Funding of Research." *The Nutrition Source*, Harvard T.H. Chan School of Public Health. Updated July 29, 2025.

National Academy of Sciences review found industry-sponsored health studies roughly 30 times more likely to report statistically significant findings in the sponsor's favor. [1] The fasting research above doesn't show that particular fingerprint yet as the trend is very recent — but it's a habit worth applying every time, not just when it's convenient.

The more extreme end of the spectrum — OMAD, "one meal a day," a roughly 23-hour fast with an entire day's calories crammed into one sitting — has the thinnest evidence base of the group: harder to get adequate nutrition from, linked in one large study to higher mortality risk in adults over 40, and flagged by clinicians as hard to sustain outside a lab setting.[2] [3]

Religious communities have been sustaining such a meal-restricting practice for millennia. In *Buddhism*, the *Vinaya* (monastic code) directly instructs monks and nuns to eat only between dawn and noon — in practice, one real meal, nothing after — and this has been continuously observed for roughly 2,500 years. [4] *Jainism* goes further still. *Ekasana* — one meal a day, no snacks, no drinks in between — is a standard, sustainable ascetic practice, still followed today, not a rare extreme.[5]

What This Means for Your Plate

None of which means breakfast is bad for you, that three meals is secretly harmful, or that everyone should start skipping days at random. Plenty of people thrive on a fixed schedule, and routine has real value of its own. What the evidence actually supports, across every era and every version of this experiment, is something far less exciting than a hack: the human body tolerates an enormous range of eating patterns, food quality and total intake matter more than the clock, and "three meals, fixed, non-negotiable" was never a finding about your biology. It's a shift schedule that escaped the factory, moved in with your family, and has been quietly paying rent in your head ever since.

Indeed, three scheduled meals a day was never a health finding — it was a social coordination device, a shared denominator that let a factory, a school, or an army know when everyone would be fed and back at their post.

For most of the stretch of history when that device took hold, the risk it was hedging against was undersupply: not enough calories to go around, and a workforce that needed every one it could get during its waking hours. That risk hasn't left the planet — hunger remains a serious,

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[1] National Academies of Sciences, Engineering, and Medicine. *Sponsor Influences on the Quality and Independence of Health Research: Proceedings of a Workshop.* Washington, DC: The National Academies Press, 2023.
[2] "One Meal a Day: Health Benefits and Risks." *Medical News Today*, January 24, 2025.
[3] "One Meal A Day (OMAD) Diet: Safety, Benefits, Risks." *Forbes Health*, January 7, 2026.
[4] "I Tried the 'Buddhist Monk' Diet — And It Worked." *Tricycle: The Buddhist Review*, April 3, 2025.
[5] "Jainism: Ritual Practices and Religious Institutions." *Encyclopaedia Britannica*.

unsolved problem across large parts of the world, and undernutrition is still linked to nearly half of all deaths among children under five globally. But across the wealthy world, where the three-meal schedule was actually invented and is now most deeply entrenched, the dominant nutrition-related danger has quietly flipped. There are now roughly six times as many overweight adults on Earth as underweight ones, and disease linked to excess weight kills more people worldwide each year than hunger does — a genuine first in human history, and a recent one. A scheduling system built to guarantee everyone got enough is still running, by default, in exactly the populations where the more common problem is now getting too much. Looked at that way, a meal skipped here and there isn't a health fad defying tradition. It's a coordination device finally catching up to the problem it's actually being used to solve.

Chapter 2. Eight Glasses, Zero Evidence

> "Americans will love Perrier because it is nice for your digestion."[1]
> *— Gustave Leven, president of Perrier, 1977*
>
> "I have found no scientific proof that absolutely every person must 'drink at least eight glasses of water a day.'"[2]
> *— Dr. Heinz Valtin, kidney specialist, 2002*

Your kidneys have never read a wellness blog. They don't know what a "hydration goal" is, have no opinion on the color chart taped to your bathroom mirror, and have been quietly regulating your body's water balance, without supervision or a phone reminder, for considerably longer than the concept of a reusable water bottle has existed.

The claim, stated the way a gym poster states it: you need at least eight glasses of water a day, probably more, and by the time you feel thirsty you're already dehydrated — so the only safe strategy is to keep a bottle within reach at all times and sip constantly, whether or not your body actually asked for it. Ask where the number eight comes from and you get a shrug, this time in athletic wear.

Why Eight Glasses

Here's where the number actually comes from, and the answer is almost funnier than a marketing conspiracy: nobody can find where it comes from either. In 2002, a Dartmouth kidney specialist named Heinz Valtin — a man who had spent nearly forty-five years studying exactly how the body manages water, and co-authored the standard textbooks on the subject — decided to track down the scientific basis for "eight glasses a day" and published his findings in a major physiology journal.[3] His conclusion, after months of digging: there isn't one. No clinical trial had ever tested it. What he found instead were large surveys of healthy adults who routinely drank less than the prescribed amount and were, by every measure, fine.

Valtin traced the number to two likely sources, neither of them scientific. One was a 1974 book by a nutritionist recommending six to eight glasses a day — while explicitly noting that coffee,

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[1] "Our Unhealthy Attachment to Spring Water." *Slate*, April 21, 2008.
[2] "'Drink at Least 8 Glasses of Water a Day' - Really?" *Geisel School of Medicine at Dartmouth*, August 2002.
[3] Valtin, Heinz. "'Drink at Least Eight Glasses of Water a Day.' Really? Is There Scientific Evidence for '8 × 8'?" *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology* 283, no. 5 (2002): R993–R1004.

tea, milk, soft drinks, and beer all counted toward the total. The other was a 1945 U.S. government nutrition board statement recommending about two and a half liters of water daily, immediately followed, in the same sentence, by the observation that most of that amount is already contained in ordinary food. Both caveats got dropped somewhere in the retelling — the same way the "most of this is already in your food" clause quietly vanished from the meal-timing story in the last chapter. What survived was a bare number, stripped of every condition that made it reasonable, repeated by health writers and pamphlets and gym teachers until it hardened into something that sounded like biology. Valtin's own verdict, after all that searching, was blunt: "I have found no scientific proof that absolutely every person must drink at least eight glasses of water a day." He added that he found it "difficult to believe that evolution left us with a chronic water deficit that needs to be compensated by forcing a high fluid intake" — a fairly pointed way of asking why a species that survived several million years without a hydration app would suddenly need rescuing by one.

China's Opposite Obsession

Zoom out, and the specific number "eight" turns out to be a very Western obsession — but the broader instinct to treat water as a kind of medicine, requiring strict rules, shows up almost everywhere, just aimed in different directions. In China, the deeply held rule for over two thousand years hasn't been to drink more water — it's to drink it hot. The custom traces to Traditional Chinese Medicine's yin-yang framework, in which cold water was thought to shock the digestive system while hot water expelled "dampness" and restored internal balance; for centuries, fuel scarcity also made hot water an expensive comfort mostly reserved for the pregnant, the elderly, and the sick, which only deepened its reputation as something curative. The belief got a real boost during a catastrophic 1862 cholera outbreak in Shanghai, when southern China — where drinking boiled water was more established — was largely spared, and folk wisdom credited the hot water rather than the fact that boiling water happens to kill the bacteria that causes cholera.[1] The underlying instinct wasn't wrong, exactly. It was just attached to the wrong explanation, and then formalized at scale: twentieth-century public health campaigns, under both Nationalist and Communist governments, actively promoted hot water drinking nationwide, and hot water dispensers remain a fixture of Chinese offices and train stations today.[2] Two civilizations, no contact between the founding beliefs, both landing on "your default water habits are dangerously wrong unless corrected" — just pointed at opposite temperatures.

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[1] "The History Behind China's Obsession With Hot Water." *Sixth Tone*, September 28, 2017.
[2] "Why Do Chinese People Love Hot Water?" Goldthread, July 2, 2021.

How Perrier Invented an Industry

If the Chinese version of the water myth was built by medicine and reinforced by government, the American version was largely built by an advertising budget. Bottled water had actually been declining for most of the twentieth century — once municipal chlorination made American tap water reliably safe in the early 1900s, the original justification for paying for water quietly evaporated. Then, in the spring of 1977, a French company called Perrier hired an American marketing executive named Bruce Nevins and spent a few million dollars finding out whether that decline could be reversed. It could. Perrier ran television ads — one narrated by Orson Welles — full of vague, confident health claims ("nice for your digestion," in the company president's own words) and sponsored the New York City Marathon just as the American running boom was taking off, tying a bottle of French mineral water to the era's biggest new fitness obsession. [1] It worked spectacularly: Perrier sold about 3 million bottles in the U.S. in 1976 and roughly 200 million by 1979. Evian launched its own campaign the following year, aiming at the same health-and-status nerve. Within two decades, an industry that had barely existed was worth billions; global bottled water sales are now estimated near $100 billion a year — built, in no small part, on reversing a problem the public water system had already solved. The trend hasn't slowed since: gallon jugs printed with hourly time markers are now a fitness-influencer staple, and an entire electrolyte-supplement industry has layered a second product line — "you're probably sodium-deficient too" — on top of the same original assumption. [2]

Two Quick Corrections

A couple of related beliefs deserve a quick correction while we're here. Coffee and tea, long treated as suspect because caffeine is a mild diuretic, turn out to count toward daily fluid intake just fine for people who actually drink them regularly. The diuretic kick is real for an occasional coffee drinker, but the kidneys adapt to habitual caffeine within days — which is why a 2014 crossover trial found no measurable difference in hydration markers between habitual coffee drinkers on coffee versus on plain water. [3] And "detox water" — lemon water, cucumber water, any infusion promising to flush out toxins — asks water to do a job it doesn't need help with: your liver and kidneys already filter your blood continuously, free of charge, without a mason jar's supervision. Adding a lemon slice doesn't give them a raise. [4] What a squeeze of lemon or a few cucumber slices genuinely does is cut the greasy aftertaste of a heavy meal in your mouth

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[1] "The Ad Campaign that Convinced Americans to Pay for Water." *Priceonomics*, March 20, 2022.
[2] "Our Unhealthy Attachment to Spring Water." Slate, April 21, 2008.
[3] Killer, Sophie C., et al. "No Evidence of Dehydration with Moderate Daily Coffee Intake: A Counterbalanced Cross-Over Study in a Free-Living Population." *PLoS ONE* 9, no. 1 (2014): e84154.
[4] "Lemon Water Won't Detox or Energise You. But It May Affect Your Body in Other Ways." *The Conversation*.

— a real, if minor, sensory effect that the marketing then leans on heavily, repackaging an ordinary palate-cleansing trick as a metabolic one.

The Distilled Water Scare

A more serious-sounding claim circulates about distilled water specifically — that it "leaches minerals from your body" and is actively dangerous to drink.[1] This one deserves more care than a flat yes or no, because there's genuine World Health Organization research behind a *version* of it. What that research actually flags is narrower than the popular claim: water normally supplies a modest share of your daily calcium and magnesium, and stripping it out removes that small dietary source; separately, demineralized water is chemically "aggressive" enough to corrode pipes and leach metals from plumbing on its way to your glass, which is a real industrial concern. Population studies do show soft, mineral-poor water regions have somewhat higher rates of cardiovascular disease — but the WHO's own reviews describe that as an observed association, not proven causation. The specific, vivid image of distilled water pulling calcium directly out of your bones hasn't held up well under closer study. For scale: a single glass of milk contains more calcium than you'd lose from drinking a gallon of distilled water. It's a real, published, worth-knowing caveat for someone relying on demineralized water as their only fluid source for years — not a reason to worry about the occasional bottle.[2]

When More Water Becomes Dangerous

And here's the part the "more is always better" crowd tends to skip: water is not risk-free at scale. In 2007, a Sacramento radio station ran an on-air contest called "Hold Your Wee for a Wii," daring listeners to drink as much water as possible without urinating, to win a game console. A twenty-eight-year-old contestant named Jennifer Strange drank about six liters in three hours, went home with a splitting headache, and died that same day from water intoxication — technically hyponatremia, a dilution of blood sodium that overwhelms the kidneys' capacity and can cause fatal brain swelling. She isn't a freak exception: a 2005 study in the *New England Journal of Medicine* found that roughly one in six marathon runners develops some degree of hyponatremia, mostly from earnestly following the exact advice this chapter opened with — drink early, drink often, drink before you're thirsty.[3] A healthy kidney at rest can clear about a liter of water an hour; under the physical stress of a marathon, that capacity can

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[1] "Can You Drink Distilled Water? What Science Says About Safety and Health." *TapWaterData*, March 19, 2026.
[2] Kozisek, Frantisek. "Health Risks from Drinking Demineralised Water." World Health Organization.
[3] Almond, Christopher et.al. "Hyponatremia among Runners in the Boston Marathon." *New England Journal of Medicine* 352, no. 15 (2005): 1550–1556.

drop to a tenth of that. "Better safe than sorry, just drink more" turns out to have an actual ceiling, and it's lower than most people assume.[1]

The Camel's Hump Problem

There's a genuinely elegant piece of chemistry sitting underneath all of this, and it's completely real: when your body burns fat for fuel, the reaction — fat plus oxygen — produces carbon dioxide and water as byproducts, the same basic chemistry as a candle flame fogging up a cold glass held above it. This is called metabolic water, and it's a legitimate textbook fact: a camel's hump is mostly fat rather than water for exactly this reason, releasing water as its owner burns through those reserves in the desert.[2] It's tempting to stretch this into "so exercise actually generates hydration, meaning I need less water when I work out" — and that stretch is exactly the kind of thing worth double-checking. A 1981 survey of the camel research found the opposite of the tidy textbook version: in genuinely hot conditions, the extra breathing needed to take in enough oxygen for that fat-burning, plus the sweating needed to dump the heat it generates, costs the animal more water than the fat oxidation produces — a net water *deficit*, not a surplus, from the very process popular science credits with keeping camels hydrated.[3]

Human exercise runs on the same logic at a smaller scale: burning fat does generate a real, measurable trickle of metabolic water, but a typical workout's sweat losses are many times larger than that trickle. The chemistry is entirely true. The conclusion that it changes your hydration math is not.

The Pattern

The pattern here should feel familiar by now. A real but narrow finding — some Americans in 1945 needed about this much total fluid, most of it from food — gets stripped of its caveats until it's a bare, memorable number. An industry with a genuine financial stake in the answer, first bottled water and now wearables and hydration apps, has every reason to leave the caveats gone. And because the failure mode of mild underdrinking is subtle — a bit of a headache, some fatigue — while the failure mode of "just drink more" is invisible right up until it occasionally kills someone at a radio contest, the incentives all point the same direction: toward more warnings, more bottles, more reminders, and fewer honest sentences about the fact that thirst is a well-evolved signal most healthy people can simply trust.

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[1] "Strange but True: Drinking Too Much Water Can Kill." *Scientific American*, updated February 20, 2024.

[2] "Camel Hump: Composition, Bioactivities, and Multifunctional Sustainable Applications." *Frontiers in Nutrition* (2026).

[3] Candlish, J. K. "Metabolic Water and the Camel's Hump — A Textbook Survey." *Biochemical Education* 9, no. 4 (1981): 154–156.

None of this means hydration doesn't matter — it obviously does, especially in heat, illness, or heavy exercise, and plenty of people genuinely don't drink enough. But the evidence for a universal, fixed, higher-than-thirst-suggests number has never existed, in any of the versions sold under that promise, hot or cold, bottled or free. The body is a complicated, tolerant system with a lot more give built into it than any of these rules credit it for, and the honest conclusion is rarely as one-sided as the poster on the gym wall makes it sound. Your kidneys were handling this before the chart on the bathroom wall existed, and they'll most likely keep handling it fine without one.

Chapter 3. The Great Fat Flip-Flop

> "Maybe if the idea got around again that obesity is immoral, the fat man would start to think."[1]
> — *Ancel Keys, physiologist, quoted in* Time, *1961*
>
> The entire diet-heart hypothesis is "the greatest medical scandal in modern time."[2]
> — *Dr. Uffe Ravnskov, on the diet-heart hypothesis*

In 1961, a University of Minnesota physiologist named Ancel Keys made the cover of *Time* magazine, and Americans have been half-listening to what he said and half-listening to what everyone since has said about him ever since.

Here's the myth in its most-repeated modern form, popular across a thousand blog posts and at least one bestselling book: a single, egotistical scientist cherry-picked data from seven countries out of twenty-two available, threw out the ones that didn't fit — France, most famously, suspiciously fine despite all that butter and cheese — and single-handedly convinced the world that saturated fat causes heart disease, dooming three generations to margarine and fat-free cookies. It's a satisfying story, because it turns fifty years of dietary guidance into the fault of one bully with a grudge and a graph.

The Cherry-Picking Myth

It's also, on the specific charge of burying seventeen countries' worth of inconvenient data, not really true. The famous "cherry-picked" graph — six countries, one suspiciously tidy upward line — doesn't come from the Seven Countries Study at all. It's from an earlier, smaller presentation Keys gave at a New York hospital in 1953, four years before the actual Seven Countries Study even began enrolling its roughly thirteen thousand men across Finland, Greece, Italy, Japan, the Netherlands, the U.S., and Yugoslavia.[3] [4] The real study published results from every country it enrolled. What did happen is closer to ordinary scientific messiness than conspiracy: Keys chose which countries to study before he had his answer, the design was observational rather than experimental — able to show correlation, not prove causation — and a contemporary critic,

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[1] "The Posthumous Assassination of Dr. Ancel Keys." *HuffPost*, December 19, 2016.
[2] "Is There More to a Healthy-Heart Diet Than Cholesterol?" *Nature*, June 9, 2021.
[3] Keys, Ancel. "Atherosclerosis: A Problem in Newer Public Health." Journal of Mount Sinai Hospital, New York, Vol. 20, No. 2, pp. 118–139, July-Aug. 1953.
[4] "Bad Science or Bad Journalism? Top Experts Come Together to Address Nutrition Myths." *Blue Zones*, September 23, 2022.

biostatistician Jacob Yerushalmy, plotted a wider set of twenty-two countries using the era's national data and found the fat-heart disease link mostly evaporated, while flagging other candidates Keys' framing had left out, including cigarettes, cars, and sugar.[1] That's a legitimate scientific objection. "He faked it and buried the truth" is a better story than "a huge 1950s observational study had real methodological limits, and so did the version of that story retold sixty years later" — but only one of them is accurate.

One more layer, since we're already being careful: several of the loudest modern voices arguing Keys was a fraud have their own disclosures worth knowing about. One prominent critic, whose book helped popularize the "cherry-picked" narrative, has acknowledged receiving honorariums from meat and dairy industry groups.[2] That's not a reason to dismiss her arguments any more than a university salary was a reason to dismiss Keys' — it's a reason to check everyone's math, not just the side you're already inclined to distrust.

What Was Actually on the Plate

Here's a fact that undercuts the whole "low-fat guidance ruined America" narrative from a completely different angle, regardless of what you conclude about Keys personally: Americans never actually went on a low-fat diet. Using USDA food-availability data adjusted for waste, per-person fat consumption rose steadily through the exact decades everyone was supposedly avoiding it — from around 147 grams a day in 1970 to roughly 190 grams a day by 2010.[3] The guidelines said eat less fat. In aggregate, people ate more of it, plus more sugar, plus more calories overall. The popular morality tale, that a scared and obedient public swapped steak for cookies and that's what made everyone sick, doesn't survive contact with what was actually on the plate.

The Sugar Playbook

What did shift, and probably so, was who got blamed for what. Historians combing through internal documents found that a sugar industry trade group secretly funded a 1967 literature review, published in the *New England Journal of Medicine*, that downplayed sugar's role in heart disease and pointed the finger at fat instead, without disclosing who paid for it.[4] That's not a folk theory — it's a documented, funded campaign, uncovered decades later in archived industry papers, running at roughly the same time Keys' more honestly-flawed science was

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[1] "How Ancel Keys Created the Diet-Heart Hypothesis." *Medium*, February 16, 2021.

[2] "The Posthumous Assassination of Dr. Ancel Keys." *HuffPost*, December 19, 2016.

[3] "Bad Science or Bad Journalism? Top Experts Come Together to Address Nutrition Myths." *Blue Zones*, September 23, 2022.

[4] Kearns, Cristin E., Laura A. Schmidt, and Stanton A. Glantz. "Sugar Industry and Coronary Heart Disease Research: A Historical Analysis of Internal Industry Documents." JAMA Internal Medicine 176, no. 11 (2016): 1680–1685.

hardening into national policy. (One nutritionist, John Yudkin, spent the same years arguing sugar deserved more of the blame and fat less — and was professionally sidelined for it, in a case modern researchers now treat rather more sympathetically than his contemporaries did.) A genuine methodological weakness and a genuine funded conspiracy were operating on the same question, at the same time, and it's taken decades to sort out which parts of "fat is the enemy" came from which source.

Crisco and the Candle Business

The guidance to cut saturated fat needed something to replace it with, and the food industry had already spent half a century building exactly that replacement, for reasons that had nothing to do with cardiology. In 1911, Procter & Gamble launched Crisco, a solid white shortening made from cottonseed oil — which the company happened to have an enormous surplus of, having spent decades buying cottonseed-oil factories to supply its soap and candle business, right before the light bulb quietly killed the candle market. Hydrogenation, a new industrial process that could turn liquid vegetable oil solid the way lard is solid, let P&G repurpose all that leftover oil into something that looked, cooked, and baked almost exactly like lard. The marketing never mentioned cottonseed. It leaned entirely on vague, confident health language — "all vegetable," "more digestible," doctor-endorsed, more "modern" than old-fashioned animal fat. Within five years, Americans were buying more than sixty million cans a year. Lard, a kitchen staple for generations, was old-fashioned within one.[1]

The Trans Fat Twist

Here's the twist that makes this story better, not worse, for anyone rooting for the "industry suppressed the truth" version of events: the hydrogenation process used to make Crisco creates trans fats, and trans fats eventually turned out to be one of the most confidently, unambiguously harmful things ever identified in the food supply — a genuinely rare case of nutrition science reaching a real, replicated, largely uncontested verdict. Trans fat is one of the only dietary fats that raises LDL cholesterol and lowers HDL cholesterol at the same time; a landmark 1993 study in *The Lancet* found a strong link to coronary heart disease,[2] and by 2015 the FDA had ruled partially hydrogenated oils no longer "generally recognized as safe," giving manufacturers until 2018 to remove them.[3] This wasn't a quiet reform: two independent studies found that New York counties which restricted trans fats for at least three years saw a 7.8% drop in heart attacks and a 4.5% drop in cardiovascular deaths compared to counties with no

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[1] Historical account of Crisco's 1911 launch and marketing, drawn from company and food-history records.
[2] "FDA Moves to Ban Trans Fats." American Association for the Advancement of Science.
[3] "Trans Fat." U.S. Food and Drug Administration.

restriction — a real population-level result, not a modeling exercise.[1] By some accounts, the margarine industry hated those early findings just as much as the sugar industry hated research pointing at sugar. So: real manufactured demand for a product that displaced a traditional fat using unearned health claims, yes. But the product that replaced lard also turned out to contain a genuinely dangerous ingredient that took the better part of a century and a federal ban to remove — a messier, more honest story than either "industry lied and animal fat was fine all along" or "industry was right and animal fat was always the problem."

Does Fat Even Make You Fat?

Which brings us to the question this chapter's title practically demands: does eating fat make you fat, or is that carbohydrates' job? Honest answer: nobody currently knows for certain, and two serious camps of research scientists are still arguing about it in real journals, not just online.

The traditional view, the energy balance model, holds that weight gain comes down to calories in versus calories out, with the type of calorie mattering far less than the total. A competing view, the carbohydrate-insulin model — championed by Harvard's David Ludwig — argues the causal arrow runs the other way: refined carbohydrates spike insulin, insulin tells fat cells to hoard incoming energy, and that hoarding is what drives hunger and overeating, rather than overeating being what fills the fat cells in the first place.[2]

Kevin Hall, a researcher at the NIH, ran a tightly controlled feeding study specifically designed to test this — twenty adults, four weeks, every meal prepared and measured inside a metabolic research unit — and found the opposite of what the model predicts: people eating a high-carb, low-fat diet ate several hundred fewer calories a day than they did on a low-carb, high-fat diet, not more. "We got exactly the opposite results of what was predicted by the carbohydrate-insulin model," Hall said afterward.[3] Ludwig and colleagues have published detailed rebuttals arguing Hall's studies don't test the model fairly, and the back-and-forth has run for the better part of a decade, including a public dispute over how to interpret Hall's own data. Both camps agree that cheap, convenient, ultra-processed food is driving the obesity crisis. They disagree, genuinely and currently, on the mechanism — which makes "fat doesn't make you fat, carbs do" a real hypothesis some serious scientists hold, not a settled fact anyone can act on with confidence yet.

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[1] "Mechanisms of Action of *trans* Fatty Acids." *PMC*, National Center for Biotechnology Information.

[2] Ludwig, David S., et al. "The Carbohydrate-Insulin Model: A Physiological Perspective on the Obesity Pandemic." *American Journal of Clinical Nutrition* 114, no. 6 (2021): 1873–1885.

[3] Hall, Kevin D., et al. "Effect of a Plant-Based, Low-Fat Diet versus an Animal-Based, Ketogenic Diet on Ad Libitum Energy Intake." *Nature Medicine* 27 (2021): 344–353.

The Gorilla Problem

A related claim shows up constantly alongside that debate: look at the animal kingdom, people say — plant-eaters get fat, meat-eaters get lean and muscular, so clearly carbohydrates fatten and protein builds muscle. It's a vivid image, and it's also easy to falsify with the first three animals that come to mind. Gorillas are herbivores and among the most muscular primates alive. Elephants and bison, also herbivores, are not exactly soft. Meanwhile bears, happy to eat meat, deliberately pack on enormous fat reserves before hibernating, and a seal — built almost entirely of blubber — is about as carnivorous as a mammal gets. Body composition across species tracks what an animal's life actually demands: energy storage for migration or winter, speed for hunting or evading being hunted, insulation for cold water — not which macronutrient dominates its diet. There is a real, much narrower human finding hiding underneath the folk version: some studies do find modestly lower lean body mass in vegetarians and vegans compared to omnivores, plausibly tied to plant protein's lower content of a specific amino acid and somewhat lower digestibility. [1] That's worth knowing. "Vegan eaters get fat, meat eaters gain muscle, just look at nature" is not — it's a story that survives exactly as long as you don't picture a gorilla.

Cholesterol's Own Flip-Flop

The other institution that fell alongside fat was cholesterol, and it fell hard enough that the reversal is now, quietly, official — official enough that it's worth being honest about how far the pendulum has swung in both directions, including in this chapter's own epigraph.

For decades, U.S. dietary guidelines capped cholesterol intake at 300 milligrams a day and treated eggs like a controlled substance — three yolks a week, tops, doctor's orders. Keys himself helped cement this: in 1961, the same year he made the cover of *Time*, he landed a seat on the American Heart Association's nutrition committee, previously skeptical of his hypothesis, and that committee issued the country's first guidelines specifically targeting saturated fat and cholesterol together. In 2015, the Dietary Guidelines Advisory Committee dropped the 300-milligram cap entirely, and the 2025 update reaffirmed eggs as part of a healthy diet, citing their vitamin D and choline content.[2]

That kind of reversal is exactly what makes "the whole thing was a scandal" feel like the obvious conclusion — the argument behind this chapter's second epigraph. Uffe Ravnskov, a Danish physician and founder of an organization called The International Network of Cholesterol

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[1] Comparative primate and mammalian body-composition research; see also carbohydrate-insulin model sources above.

[2] American Heart Association nutrition committee history and 2015/2025 Dietary Guidelines Advisory Committee reports.

Skeptics,[1] has spent decades arguing not just that the 300-milligram rule was too strict, but that cholesterol and saturated fat play essentially no causal role in heart disease at all, and that the entire diet-heart hypothesis survives only because, in his words, its supporters "ignore or misquote" the evidence against it.[2] It's a systematically argued, confidently written case. It also runs directly into evidence that's emerged since Keys' era and that the case mostly doesn't engage with.

Mendelian randomization studies[3] — which use naturally occurring genetic variants as a kind of built-in randomized trial, since your genes get assigned essentially at random at conception rather than chosen by your lifestyle — consistently find that people with genetically lower LDL cholesterol have substantially lower rates of heart disease, in a dose-dependent way, replicated across different genes and different populations. That finding gets independent confirmation from an unlikely direction: statins, ezetimibe, and PCSK9 inhibitors are three drug classes that lower LDL cholesterol through three different biological mechanisms, and all three produce a similar reduction in heart attacks and strokes — roughly 20% per 1 mmol/L of LDL lowered — hard to explain if the benefit were some side effect specific to one drug rather than the cholesterol-lowering itself. [4] People born with familial hypercholesterolemia, a genetic condition causing very high LDL from birth, routinely have heart attacks in their twenties and thirties with no other risk factors present, which is a difficult fact for "cholesterol doesn't really do anything" to sit next to. And Ravnskov's most-cited specific claim — that low cholesterol is just as dangerous as high cholesterol, which he uses to argue the whole relationship runs backward — has a well-studied explanation that isn't mysterious: serious illness, including late-stage cancer, tends to lower cholesterol as a symptom of being sick, so studies that don't account for this can make a dying patient's low cholesterol look like a cause of death rather than a consequence of already dying.

None of which means the 300-milligram rule was right, or that "cholesterol is bad" was ever a precise, well-earned piece of guidance. It genuinely wasn't: dietary cholesterol's effect on blood cholesterol is smaller and more individually variable than the old rule implied — roughly 15–25% of people are "hyper-responders" who see a real rise, while most people's blood cholesterol barely moves at all [5] — and a lot of what got blamed on cholesterol specifically was really saturated fat riding along in the same foods, since nearly every cholesterol-rich food is

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[1] "Uffe Ravnskov." *Wikipedia*.

[2] "The Cholesterol Myths." Uffe Ravnskov, via pswscience.org event listing.

[3] "Mendelian Randomization Studies: Using Naturally Randomized Genetic Data to Fill Evidence Gaps." *Current Opinion in Lipidology* (2015), via PubMed.

[4] "Relative Effects of LDL-C on Ischemic Stroke and Coronary Disease: A Mendelian Randomization Study." *PMC*, National Center for Biotechnology Information.

[5] "The Effect of Diet on Cardiovascular Disease and Lipid and Lipoprotein Levels." *Endotext*, NCBI Bookshelf.

also saturated-fat-rich, eggs and shrimp being the two notable exceptions.[1] [2] But "the diet-heart hypothesis is the greatest medical scandal in modern time" swaps one overconfident, thinly-evidenced certainty for another, better-written one. The correction can turn into its own myth just as easily the second time as the first.

Zooming Out

Zoom out and this chapter has been circling something a little different from most of the others: not just how a myth gets made, but how the correction to a myth can turn into its own myth, stated just as confidently and checked just as thinly. It happened once with Keys, whose real methodological limits calcified into a "he faked the whole thing" legend more dramatic than the facts support. It happened again with the cholesterol backlash, where a genuinely overstated rule collapsed, for some, into "cholesterol was never the problem" — a claim the newer genetic and pharmacological evidence doesn't support either. A flawed study becomes policy becomes decades of fear becomes a contrarian movement insisting the opposite was obvious all along, and at every step, the certainty on offer outran what the evidence, at that moment, actually supported.

The Fat-Free Trap

Meanwhile, the food industry took "eat less fat" and ran, producing one of the more instructive junk-food case studies of the twentieth century. In the 1990s, "fat-free" became a label people trusted almost blindly, and manufacturers obliged: fat-free cookies became a national phenomenon by cutting the fat and adding back sugar and refined starch, landing at close to the same calorie count as the regular version while marketing itself as the responsible choice. [3] People, understandably, ate the whole box instead of two. That's a genuinely useful cautionary case — removing one nutrient and quietly loading up on another isn't the health upgrade the front of the package implies, and a "fat-free" label says nothing about what filled the gap. Where the story usually gets oversold is the next step: the popular claim that this exact substitution trick single-handedly caused the modern obesity epidemic. Researchers who've actually looked at the consumption numbers push back on that — total fat intake barely moved during the supposed low-fat era (see above), guidelines were warning about added sugar the entire time too, and blaming an entire epidemic on cookie reformulation is a tidier story than the underlying data supports.[4] The substitution trick is real and worth watching for on any "-

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[1] American Heart Association. "Here's the Latest on Dietary Cholesterol and How It Fits in with a Healthy Diet." August 25, 2023.

[2] "Dietary Cholesterol and the Lack of Evidence in Cardiovascular Disease." *PMC*, National Center for Biotechnology Information.

[3] "The 'Healthy' Low-Fat Cookie That Defined the '90s." *Tasting Table*, August 4, 2025.

[4] "Burying the Snackwell Myth." *CSPI, via Medium*, March 6, 2017.

free" label. The claim that it explains everything that went wrong with the American diet is its own small myth, riding on the back of a true one.

What to Actually Cook With

So where does that leave the actual fat on your actual stove? With less certainty than either the 1980s guidelines or their contrarian replacements would like to admit — but with a few things worth acting on with real confidence. Trans fat is the one clear villain in this entire chapter, and it deserves to be treated that way without hedging: uniquely damaging to your cholesterol profile, backed by real population-level evidence from actual bans, and worth checking for by ingredient list — "partially hydrogenated" oil — rather than trusting a "0g trans fat" label, which is legally allowed even when a product contains just under half a gram per serving. "Fat-free" processed foods deserve real suspicion too, not because fat-free is inherently dangerous, but because whatever replaced the fat is usually the more relevant number on the label.

Beyond that, the honest state of the science doesn't support crowning a single correct cooking fat, animal or vegetable, as the proven winner — that verdict simply doesn't exist yet, no matter how confidently either side states it. What it does support is that the blanket fear of traditional fats — butter, olive oil, tallow, lard, ghee — was built on thinner evidence than the certainty implied, and that a lot of that fear survived less because it was proven and more because it was profitable, convenient, or just repeated long enough to stop sounding like a claim.

Cook with the fat that suits what you're making and that you actually enjoy: butter for a pastry that needs it, olive oil for a dish built around it, tallow or lard if that's what makes your pie crust or roast potatoes taste the way you remember. None of them are the villain the last fifty years made them out to be. None of them are quite the proven cure their newest champions want them to be, either.

Chapter 4. The Eight-Hour Myth

> "Early to bed, early to rise, makes a man healthy, wealthy, and wise." [1]
> — *Old Proverb, popularized by Benjamin Franklin's* Poor Richard's Almanack, *1735*
>
> "That's like saying everybody in the population has to be 5 foot 10. That's not how genetics works."[2]
> — *Louis Ptáček, neurologist, on fixed sleep-duration rules*

Nobody has ever needed a doctor's note to justify how much they slept, and yet almost everyone can recite the same number with total confidence: eight hours, non-negotiable, or something has quietly gone wrong with you. Ask why eight specifically, rather than six or ten, and the answer gets vaguer fast.

The Bell Curve Nobody Mentioned

Here's the claim as it's usually delivered: humans need eight hours of continuous, unbroken sleep, every single night, on a fixed and early schedule, because that's simply how the human body is built — and any deviation, whether it's five hours, a broken night, a late bedtime, or an afternoon nap, is a small, cumulative act of self-harm.

The number itself isn't made up from nothing — large population studies genuinely find that adults sleeping somewhere around seven to nine hours tend to have better long-term health outcomes than adults sleeping much less. But "true on average, across a population" and "true for you, specifically" are different claims, and the gap between them has a name: natural short sleepers. Roughly one to three percent of people carry rare genetic mutations for this. The first identified, in 2009, was in a gene called DEC2, found in a mother and daughter who both functioned normally on about six hours a night; a second turned up a decade later in a gene called ADRB1; a third, in a gene called SIK3, was described more recently still.[3] People with these mutations sleep four to six hours a night for their entire lives, report no cognitive or metabolic penalty for it, and are, by every measure researchers have thought to check, simply fine.[4] Ying-Hui Fu, the UCSF geneticist who has led much of this research, and her colleague Louis Ptáček have made the same point to journalists more than once: sleep duration follows a

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[1] "Early To Bed And Early To Rise Makes And Man Healthy, Wealthy And Wise — Meaning & Origin Of The Phrase." *phrases.org.uk*.
[2] "The Ones Who Need Little Sleep." *Knowable Magazine*, January 30, 2025.
[3] "Why Do Some People Need Just Four to Six Hours of Sleep?" *Scientific American*, December 17, 2024.
[4] "Are You a Genetically Short Sleeper?" *Psychology Today*, October 4, 2022.

bell curve like almost every other human trait, and treating one point on that curve as a universal rule misunderstands what a bell curve is. "That's like saying everybody in the population has to be 5 foot 10," Ptáček has said. "That's not how genetics works."[1]

Here's the honest complication, because this isn't a clean permission slip either: true genetic short sleepers are rare, and most people who insist they thrive on five hours are not one of them. A sleep specialist at the Henry Ford sleep laboratory put it more bluntly: most of the time, what someone actually has is a well-practiced tolerance for sleep debt, not a genetic exemption from needing sleep — they've simply forgotten what properly rested feels like. Short of family history and a genetic test, there's no reliable way to tell the two apart from the inside, which is exactly the detail that goes missing when "I only need five hours" turns from a rare mutation into a personality trait.

Do Meditators Really Sleep Less?

Stories about advanced meditators sleeping barely at all, or not sleeping for years on end, sit somewhere between genetic short sleepers and outright folklore — and the honest answer splits down the middle, depending on which specific claim you're checking.

The modest version has real, controlled research behind it. A 2010 study compared seven long-term meditators in Delhi against twenty-three age- and sex-matched non-meditating controls and found the meditators sleeping a genuine 5.2 hours a night on average, against 7.8 hours for the controls — a real, measured difference of more than two and a half hours.[2] But the same researchers, to their credit, went further: they put those meditators through a full night of total sleep deprivation and then asked them to meditate. If meditation could substitute for sleep, this should have been easy. Instead, the meditators reported being generally too tired to meditate successfully — direct evidence against the idea that meditation is some kind of sleep bypass, rather than a state that gets less restorative, like everything else, once you're genuinely exhausted. The researchers' own preferred explanation is more modest and more interesting: experienced meditators may simply get more restorative sleep per hour — deeper slow-wave sleep, more stable REM — meaning they need fewer hours to extract the same benefit, not zero hours. That's a genuinely surprising, well-supported finding. It's also a long way from "doesn't sleep at all." [3]

The more dramatic version of the claim is much harder to pin down. Ajahn Maha Bua, a widely respected teacher in the Thai Forest Buddhist tradition, is reported to have slept only one to

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[1] "The Ones Who Need Little Sleep." *Knowable Magazine*, January 30, 2025.

[2] Kaul, Prashant, Jason Passafiume, Craig R. Sargent, and Bruce F. O'Hara. "Meditation Acutely Improves Psychomotor Vigilance, and May Decrease Sleep Need." *Behavioral and Brain Functions* 6, no. 47 (2010).

[3] "Meditation, Sleep, and Performance." *OBM Integrative and Complementary Medicine*, May 24, 2019.

two hours a night for decades — a claim repeated often in devotional and popular accounts, though it doesn't appear to have been tested under anything like the controlled conditions of the study above.[1] That's not a reason to assume he was lying; it's a reason to notice the difference between "a respected teacher's students recall this about him" and "a monitored, replicated finding."

The clearest illustration of how these claims tend to fare under real scrutiny isn't about sleep at all, but the same genre of claim, aimed at food and water instead. Prahlad Jani, an Indian sadhu, claimed to have gone without eating or drinking anything for over seventy years, and was twice examined by Indian military physiologists — most notably a fifteen-day observation in 2010, under round-the-clock CCTV, that reported no food, water, urine, or stool the entire time.[2] It's a genuinely startling result on its face. It's also worth knowing that the findings were never submitted to a peer-reviewed journal — they went to a blogger instead — that Jani was permitted contact with water for gargling and bathing throughout, which rationalist critics have pointed out as exactly the kind of loophole that could explain incidental fluid absorption, and that an independent offer to have him examined under outside conditions in the United States went unanswered.[3] None of that proves fraud. But a fifteen-day supervised window, however carefully monitored, was never actually capable of confirming a seventy-year claim in the first place — the math doesn't reach, no matter how clean the two weeks were.

Not every extraordinary claim in this territory gets waved off, though, and the most genuinely interesting case belongs to actual credentialed scientists rather than true believers or professional skeptics. *Tukdam*, a state some Tibetan Buddhist meditators are said to enter around the time of death, is associated with a real and specifically measurable phenomenon: the body's decomposition visibly slows or stalls for days, occasionally weeks, past the point where decay would normally be obvious. The Dalai Lama personally asked scientists to investigate it, and neuroscientist Richard Davidson — no stranger to skepticism, and the same researcher behind decades of mainstream meditation studies at the University of Wisconsin — has spent years doing exactly that through what's now called the Tukdam Project.[4] In 2021, the project published the first peer-reviewed paper on the subject, testing thirteen monks recognized by Buddhist medical and religious authorities as being in tukdam, all clinically dead for at least twenty-six hours. The EEG results found no detectable brain activity in any of them — directly testing, and not supporting, the more dramatic claim that these monks remain

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[1] "Monks, Meditation, and Sleeping." *Beds on Legs*, June 27, 2025.
[2] "Scientists Baffled by Prahlad Jani, Man Who Doesn't Eat or Drink." *ABC News*, June 1, 2010.
[3] "Dr. Sudhir Shah and Prahlad Jani." *Skeptimedia — The Skeptic's Dictionary*.
[4] "Inside the First-Ever Scientific Study of Post-Mortem Meditation." *Tricycle: The Buddhist Review*.

conscious after death.[1] What's left, and still genuinely unexplained, is the delayed decomposition itself: real, photographed, and published, with no confirmed mechanism yet.

Franklin's Recycled Proverb

The specific advice to go to bed early and rise early has an even longer paper trail than most proverbs get credit for. Benjamin Franklin printed "early to bed, early to rise, makes a man healthy, wealthy, and wise" in *Poor Richard's Almanack* in 1735, and gets the credit for it in roughly a hundred percent of tellings — but versions of the same sentiment turn up in English print by at least 1639, and something close to it has been attributed, probably apocryphally, all the way back to Aristotle.[2] Franklin was repeating an old chestnut, in much the same way Adelle Davis was repeating a 1584 butter proverb when she told America to eat breakfast like a king.

Does the advice actually hold up? A study designed specifically to test what its own authors called "the Benjamin Franklin hypothesis" — separating early risers from late risers and checking for differences in health, wealth, or wisdom — found no significant association among any of the three.[3] What sleep-timing research does support is narrower and less quotable: consistency matters, and so does matching your schedule to your own chronotype, the genetically-influenced preference some people have for mornings and others have for nights. Forcing a natural night owl onto a 5 a.m. wake time doesn't make them more like an early riser — it produces what researchers call social jetlag, a chronic, weekday-shaped version of the grogginess you'd get from actually crossing time zones, because the body is still running on its own schedule regardless of what the alarm says. The proverb isn't exactly wrong that routine matters. It's wrong about which routine, applied to which person, at which hour.

Are Night Owls Actually Smarter?

That chronotype divide comes with its own tangle of a myth: are night owls, on average, smarter than early risers? Here the honest answer is a genuine "it's complicated, and the field keeps changing its mind." A widely cited 2009 study of more than twenty thousand American adolescents found a small but real positive correlation between "eveningness" and IQ, holding up even after controlling for demographics. [4] [5] A follow-up study using GMAT scores found night owls outperforming early risers, and a 2011 meta-analysis confirmed a small overall link

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[1] Lott, Dylan T., et al. "No Detectable Electroencephalographic Activity After Clinical Declaration of Death Among Tibetan Buddhist Meditators in Apparent Tukdam." *Frontiers in Psychology* 11 (2021): 599190.

[2] "Early To Bed And Early To Rise Makes And Man Healthy, Wealthy And Wise — Meaning & Origin Of The Phrase." *phrases.org.uk*.

[3] "Does 'Early to Bed, Early to Rise' Actually Work? Science + Franklin." *Ben Franklin Virtues*, January 31, 2026.

[1] "Night Owls Psychology: The Science Behind Late-Night Personalities." *Neurolaunch*, April 26, 2026.

[5] Kanazawa/Perina-related chronotype and GMAT/IQ data, via University of Chicago-hosted PDF.

between staying up late and measured cognitive performance. [1] More recently, a 2024 study of nearly 27,000 people in the UK Biobank found evening types scoring better on cognitive tests than morning types, even after adjusting for smoking, alcohol, and chronic illness.[2] So far, advantage: owls.

Except a large share of this advantage evaporates once you account for when the test was given — morning people test better in the morning, evening people test better in the evening, and much of the apparent "chronotype effect" turns out to be a testing-time effect wearing a chronotype's clothes.[3] And a 2025 study tracking cognitive decline over a ten-year period found the opposite pattern for long-term brain health: night owls declined faster than morning people, an effect concentrated mostly in highly educated people forced into early schedules by their jobs — which points the finger back at social jetlag rather than at chronotype itself.[4] Put plainly: night owls may have a small, real, timing-dependent edge on certain tests, and may also face a real long-term cognitive cost, and both of those things can be true at once, because the variable actually doing the damage looks less like "which chronotype is smarter" and more like "how badly does your schedule clash with your biology."

Can You Skip a Night?

Is skipping a full night of sleep now and then actually harmful, or is it the kind of one-off the body just shrugs off? The honest answer sits between the two extremes usually on offer. A single lost night measurably impairs reaction time, mood, and judgment the next day — some of these effects are comparable in size to legal intoxication — but for most healthy adults, one bad night followed by a genuine chance to recover doesn't appear to cause lasting harm. The catch is in the phrase "genuine chance to recover": research on chronic partial sleep restriction — five or six hours a night, repeated for a week or more, which describes most people's actual "occasional" pattern far better than a single dramatic all-nighter does — finds that subjective sleepiness levels off within a few days even as objective performance keeps getting worse. People stop feeling as impaired as they actually are, and stop noticing the deficit accumulating underneath them. A single skipped night is a real but recoverable event. A chronic string of shortened nights that everyone privately calls "occasional" is the more common, and more dangerous, version of the same myth.

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[1] "Night Owls Versus Early Birds: Who's Smarter?" *ZME Science*, December 2, 2025.
[2] "Scientists Reveal Whether Early Birds or Night Owls Are Smarter." *Newsweek*, July 17, 2024.
[5] "Night Owls Psychology: The Science Behind Late-Night Personalities." *Neurolaunch*, April 26, 2026.
[4] "Night Owls Tend to Have More Health Risks Than Early Birds — Including Cognitive Decline, New Study Finds." *Fortune*, via AOL, 2025.

Sleeping Alone vs. Sleeping Together

Whether you should share a bed at all has recently become its own minor cultural argument, complete with a name — the "sleep divorce" — for couples who've opted to sleep apart, something as many as a third of American couples now report doing at least some of the time.[1] The research on which option is actually better is a genuinely tangled knot rather than a clean win for either side. A 2022 University of Arizona survey found bed-sharing adults reporting less insomnia, falling asleep faster, staying asleep longer, and lower rates of depression and anxiety than people sleeping alone.[2] But that's self-report data, and self-report and objective measurement don't always agree here: a study that tracked ten couples with movement sensors over 28 nights each, alone and together, found that sharing a bed measurably reduced women's objective sleep efficiency — though sexual contact made the subjective experience feel better without changing the objective numbers at all.[3] Meanwhile, separate polysomnography research has found bed-sharing couples showing more, and more stable, REM sleep together than apart.[4] And an older, narrower study of women partnered with snorers found their sleep genuinely was more fragmented next to a snoring partner — though sleeping alone for a single night didn't clearly fix it either.

None of that adds up to a verdict. It adds up to: shared sleep appears to carry real relational and even neurological benefits for a lot of people, shared sleep also appears to carry a real, measurable cost for at least some people (often women, often next to a partner who snores or moves a lot), and "should you sleep alone" turns out to depend enormously on whose bed, whose partner, and whose sensor is doing the asking.

The Naked Sleep Claims

Sleeping naked has developed one of the more oddly specific reputations in casual wellness advice: better temperature regulation, deeper sleep, improved skin and fertility, even a metabolic boost from activating brown fat. Nearly every one of those claims traces back to one real, solid piece of physiology — core body temperature drops slightly as you fall asleep, and a cooler bedroom genuinely does correlate with better sleep — stretched considerably further than the evidence for it actually reaches. Even the Sleep Foundation, one of the more careful sources repeating the naked-sleep advice, includes its own quiet disclaimer: the specific practice "hasn't been directly studied," and what's actually being cited is general temperature-and-sleep

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[1] "What Are the Benefits of Sleeping Alone?" *Scientific American*, December 11, 2024.
[2] "Adults Sleep Better Together Than They Do Alone." *ScienceDaily*, June 6, 2022.
[3] "0010 Bed Sharing Versus Sleeping Alone Associated with Sleep Health and Mental Health." *ResearchGate*.
[4] "Bed-Sharing in Couples Is Associated With Increased and Stabilized REM Sleep and Sleep-Stage Synchronization." *PMC*, National Center for Biotechnology Information.

research, not a trial that put people to bed nude versus clothed and measured the difference.[1] The fertility, weight-loss, and skin-health claims stacked on top of that have even less behind them — and a fair number of the websites making them happen to sell sheets, mattresses, or sleepwear, which is its own small tell.

Grandpa's Two Sleeps

None of this is new territory for the "unbroken eight hours" assumption specifically, either. Historian Roger Ekirch spent years combing through diaries, court depositions, and literature from pre-industrial Europe and turned up hundreds of casual references to "first sleep" and "second sleep" — two separate blocks of nighttime rest divided by an hour or so of quiet waking, used for prayer, sex, tending the fire, or just lying in the dark thinking.[2] Nobody at the time described this as insomnia, because nobody expected the night to be one unbroken slab of unconsciousness to begin with. That expectation arrives later, roughly on schedule with widespread artificial lighting, which pushed bedtimes back, compressed the night into a single sitting, and quietly redefined "normal" sleep as one continuous eight-hour block.

That history also explains a thoroughly modern annoyance: plenty of older adults wake up once or twice a night to use the bathroom, and reasonably enough take it as evidence that something's wrong — is this insomnia? Did something break? But the mechanism behind it usually has little to do with sleep quality itself, and a lot more to do with plumbing.

Somewhere in middle age and beyond, the kidneys' ability to concentrate urine gradually weakens, and a key piece of why is that the day-night rhythm of antidiuretic hormone secretion flattens out: a younger body releases extra antidiuretic hormone overnight, concentrating urine and cutting down on how much of it there is; that nighttime peak fades gradually with age, so the same amount of fluid produces more urine overnight the older you get — a condition with its own clinical name, nocturnal polyuria.[3] Add a declining ability to conserve sodium and a bladder whose own capacity shrinks with age, and the number of nightly trips to the bathroom climbs on its own. An estimated half of adults over 65 get up at least once a night; past 80 the share is even higher, exceeding nine in ten men in some surveys; in some studies of older adults, the need to urinate is the single most commonly cited sleep disruptor, named more than four times as often as the runner-up, pain.[4] [5]

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[1] "Sleeping Naked." *Sleep Foundation*, September 17, 2025.

[2] Ekirch, A. Roger. *At Day's Close: Night in Times Past*. New York: W.W. Norton, 2005.

[3] Miller, M. "Nocturnal Polyuria in Older People: Pathophysiology and Clinical Implications." Journal of the American Geriatrics Society 48, no. 10 (2000); "Nocturia." StatPearls, NCBI Bookshelf, National Institutes of Health, February 17, 2024.

[4] "Focus on Nocturia in the Elderly." Medscape, December 29, 2015;

[5] "Nocturia and Disturbed Sleep in the Elderly." PMC, National Center for Biotechnology Information.

In other words, waking in the night was never the novelty. Only the excuse has changed. It used to be "time to stoke the fire." Now it's just "time for the bathroom."

In Defense of the Nap

If there's one sleep habit in this chapter that comes out looking better than expected, it's the nap. The "post-lunch dip" — that wall of drowsiness in the early afternoon — isn't actually about lunch; it shows up on the same schedule whether or not people eat, tracking a genuine dip in the body's circadian alertness rhythm rather than a food coma.[1] A short nap taken inside that window, roughly ten to twenty minutes, reliably improves reaction time, alertness, and memory for a few hours afterward without the grogginess — called sleep inertia — that comes from napping longer and waking out of deep sleep.[2] Longer naps, sixty to ninety minutes, can do more: one frequently cited study found they reversed same-day deterioration in perceptual performance by giving the brain time for a full sleep cycle, REM included. The main risk with napping isn't the nap itself; it's timing it too late in the day and eating into the sleep pressure the body needs to fall asleep that night. Siesta cultures across the Mediterranean, Latin America, and South Asia got the timing right for centuries before anyone had a word for "circadian rhythm." This is one of the rare cases in this book where the old habit and the modern research actually agree.

Sleep Apnea

This chapter has one more thing to say, and it isn't one to skim past.

There's a pattern that, on paper, clears every bar this chapter has set so far — in bed on time, up on time, a genuine eight hours logged, a schedule that's reasonably consistent — and still leaves someone waking up feeling like they never slept at all: unexplained daytime drowsiness, scattered attention, an irritability that doesn't seem to have a cause. This usually isn't a willpower problem, and it isn't a sleep-hygiene tip nobody's gotten around to trying yet. It's often a night interrupted dozens or even hundreds of times — with no memory afterward that any of it happened.

This is obstructive sleep apnea (OSA): the throat muscles relax during sleep, and the base of the tongue, the soft palate, or the throat wall partially or fully block the airway, making breathing shallow or stopping it outright for anywhere from ten to sixty seconds at a stretch. Blood oxygen drops in response, and the brain forces a brief "wake-up" just long enough to re-tighten the airway — an arousal so short that most people never remember it happening, leaving behind a

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[1] "Afternoon Nap and Bright Light Exposure Improve Cognitive Flexibility Post Lunch." *PMC*, National Center for Biotechnology Information.

[2] "Does Napping Impact Your Sleep at Night?" *Sleep Foundation*.

night sliced into dozens or hundreds of fragments. Time spent in bed can look perfectly adequate while the quality of the sleep itself has been quietly gutted.

By some estimates, somewhere between 30 and more than 80 million American adults meet diagnostic criteria for obstructive sleep apnea, roughly 80% of them never diagnosed[1]; worldwide, an estimated 936 million people have at least mild OSA, with 425 million at moderate-to-severe levels.[2] Age is one of the biggest drivers: one study found 88% of men aged 65 to 69 meeting diagnostic criteria, climbing to 90% past 70.[3] Obesity, alcohol, and sedatives all relax the throat muscles further, raising the odds of a blockage — which is one more reason the people complaining, back in the sleeping-together section, about a partner's thunderous snoring may be hearing something more than noise: a partner who is, in that moment, repeatedly failing to breathe.

Sleep position plays a bigger role than you'd expect. Lying on your back lets gravity pull the base of the tongue and soft palate backward into the airway. A retrospective study covering more than 13,000 people found that among apnea patients over 20, 64% of men and 56% of women had symptoms concentrated specifically in the supine position — the same person, lying flat, can have more than double the apnea episodes they'd have on their side, in some cases more than quadruple.[4] For this group, the 1980s came up with a blunt fix: the "tennis ball technique," sewing a tennis ball into the back of a pajama shirt to make lying flat physically uncomfortable. It genuinely works — one study found time spent on the back dropping from over 40% of the night to under 10%, with apnea episodes falling accordingly — but most people find it too uncomfortable and too easy to dislodge by rolling over; one follow-up found fewer than one in ten patients still using it 30 months after being prescribed it.[5]

Continuous positive airway pressure (CPAP) — wearing a mask overnight connected to a machine that keeps the airway propped open with pressurized air — is the recognized gold-standard treatment, and it works immediately. But in large clinical trials, CPAP's protective effect on hard cardiovascular endpoints like heart attack and stroke has stayed stubbornly inconsistent, for a deflating reason: it isn't that the machine doesn't work, it's that most people can't keep it on all night. Across multiple trials, patients wore the mask for an average of under

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[1] Watson, Nathaniel, Kristina Yu, David Campbell, et al. "0637 Prevalence and Unmet Need of Obstructive Sleep Apnea in the United States." Sleep 48, Supplement_1 (2025): A278.

[2] Benjafield, Adam V., et al. "Estimation of the Global Prevalence and Burden of Obstructive Sleep Apnoea: A Literature-Based Analysis." The Lancet Respiratory Medicine 7, no. 8 (2019): 687–698.

[3] "Prevalence of Obstructive Sleep Apnea Syndrome: A Single-Center Retrospective Study." PMC, National Center for Biotechnology Information, 2021.

[4] "Sex- and Age-Differences in Supine Positional Obstructive Sleep Apnea in Children and Adults." PMC, National Center for Biotechnology Information, 2025.

[5] "Poor Long-Term Patient Compliance with the Tennis Ball Technique for Treating Positional Obstructive Sleep Apnea." Journal of Clinical Sleep Medicine, via ResearchGate.

three and a half hours a night — short of the roughly four hours thought necessary for benefit — with overall non-adherence running 40 to 60%.[1] But narrow the analysis to the people who actually do wear it more than four hours a night, every night, and the effect shows up immediately: a 23% drop in cardiovascular and all-cause mortality, and a more than 40% reduction in major adverse cardiovascular events.[2]

So if you recognize the symptoms this section opened with or a bed partner has ever mentioned that your snoring abruptly cuts out mid-breath, go get a sleep study. Don't put it off.

What Actually Holds Up

Taken together, this chapter's myths split cleanly along a line worth noticing. Some of it is a real, population-level average stretched into a universal rule that ignores real, documented genetic variation — the eight-hour number, the early-riser advice. Some of it is a genuinely live scientific argument still being fought out in journals, not settled in either direction — night owls and cognition. Some of it is thin physiology wearing a thick coat of wellness marketing — sleeping naked. And at least one of it — the nap — turns out to be exactly as sound as your grandmother said it was. The common thread isn't that everything you've heard about sleep is wrong. It's that sleep turns out to be one of the most individually variable things a human body does, and almost everything sold as a universal rule about it is really an average, a proverb, or a product, dressed up as biology.

None of this means the general shape of common sleep advice is worthless — most people genuinely do function better on somewhere close to seven to nine hours, on a fairly consistent schedule, and napping in the early afternoon really can help rather than hurt. What the research doesn't support is treating any of those numbers as a fixed, non-negotiable requirement identical for every person, or reading every broken night, late bedtime, or bare mattress as a personal failure.

Your own sleep — how much of it you need, when you're actually alert, whether you want company in the bed or not — is one of the more genetically and individually specific things about you. The wellness industry, like the food industry a few chapters back, has a strong incentive to sell you a single, simple number instead.

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[1] "Obstructive Sleep Apnea Therapy for Cardiovascular Risk Reduction — Time for a Rethink?" PMC, National Center for Biotechnology Information.

[2] "Effects of Continuous Positive Airway Pressure on Cardiac Events and Metabolic Components in Patients with Moderate to Severe Obstructive Sleep Apnea and Coronary Artery Disease: A Meta-Analysis." Journal of Clinical Sleep Medicine (2024).

Chapter 5. The Exercise Myths That Refuse to Die

> "No pain, no gain."
> — *A gym wall, several thousand gyms, forever*
>
> "The body needs exercise, only it must not be to the point of exhaustion, for exercise expels the bad air in the system, promotes free circulation of the blood, and prevents sickness."[1]
> — *Hua Tuo, Chinese physician, circa 200 CE*

Some myths deserve a full chapter. These deserve a relay race, followed by a longer one once the relay proves there's more ground to cover.

The Original Lineup

10,000 steps. Not a finding from exercise science — a product name. In 1965, shortly after the Tokyo Olympics put fitness on the national mind, a Japanese company called Yamasa launched a pedometer named the *manpo-kei*, literally "10,000-step meter." The number was chosen because it made a catchy slogan and a round target, not because researchers had determined it was the precise dose the human body required. Walking is genuinely good for you. Ten thousand is a marketing decision that escaped its packaging.[2]

"No pain, no gain." Muscle fatigue and mild next-day soreness are a normal part of training. Sharp, acute pain during a workout is your body's alarm system working correctly, not a toll you're supposed to pay for results. Treating the two as the same thing is how people turn a manageable workout into an actual injury.

Spot reduction. You cannot choose which body part loses fat first by exercising that specific area — crunches will strengthen your abdominal muscles, but they will not "melt belly fat" out from under them. Fat loss happens across the whole body, in a pattern your genes mostly decide, no matter how targeted the exercise.

Stretching before exercise prevents injury. Static stretching (holding a long stretch before you've moved at all) has a weaker evidence base for injury prevention than commonly assumed, and some research suggests it can temporarily reduce power output right afterward. A short,

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[1] Attributed to Hua Tuo (c. 140–208 CE), Records of the Three Kingdoms, Book of Wei, "Biography of Hua Tuo."
[2] Historical account of the 1965 Yamasa "manpo-kei" pedometer launch following the Tokyo Olympics.

dynamic warm-up — moving the muscles you're about to use — tends to serve the same goal better.

Cardio is the best way to lose weight. Diet has consistently outperformed exercise alone for weight loss in study after study, and resistance training holds up at least as well as cardio for long-term body composition — "you can't out-exercise a bad diet" is one of the rare pieces of gym folklore that's actually true.

Muscle turns into fat when you stop working out. They're different types of tissue. One cannot chemically convert into the other. What actually happens is simpler and less dramatic: muscle can shrink from disuse while fat can accumulate from unchanged eating habits, and the two processes just happen to occur around the same time.

How Much Cardio Do You Actually Need?

The honest dose-response picture is both more reassuring and less tidy than either "150 minutes and stop" or "more is always better" camps would like. Guidelines from the WHO and American Heart Association set 150 minutes of moderate (or 75 of vigorous) activity a week as the evidence-based floor.[1] Above that floor, risk keeps dropping as the dose goes up — one large analysis found no point, even up to 7 hours a week, where additional exercise stopped helping, though each extra hour bought progressively less than the one before it. [#3] A now-classic 1978 study of nearly 17,000 Harvard alumni found the same diminishing-but-real curve: benefit climbed with weekly energy expenditure up to roughly 2,000–3,000 calories — coincidentally almost exactly what 10,000 daily steps works out to, which may be the one honest coincidence behind that invented number.[2]

The genuinely useful, counterintuitive finding is about *pattern*, not volume. Several large studies, including one following more than 89,000 UK Biobank participants with wrist accelerometers, found "weekend warriors" — people who cram their entire week's exercise into one or two days — get statistically indistinguishable protection against more than 200 diseases compared with people who spread the identical total across the week.[3] Total weekly volume predicts your risk. How you slice it across the calendar, for most outcomes, does not.

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[1] "Exercise Dose in Clinical Practice." *Circulation*, American Heart Association.

[2] "Exercise and Health: Dose and Response, Considering Both Ends of the Curve." *The American Journal of Medicine*.

[3] "'Weekend Warrior' Physical Activity May Help Protect Against 200+ Diseases." Massachusetts General Hospital / Mass General Brigham.

The Turtle's Alibi

A different, more fatalistic argument sometimes gets raised against all of the above: exercise burns through a body's finite store of energy faster, so movement shortens life rather than extending it — and here's a turtle, barely moving for two centuries, as the walking, or rather barely walking, proof.

The claim isn't invented from nothing. It has a real, if largely abandoned, scientific ancestor called the rate-of-living theory. In 1908, physiologist Max Rubner compared lifetime energy expenditure per gram of body weight across five domestic species plus humans and found the number came out roughly constant — mice burn through their allotment fast and die young, elephants burn it slowly and live for decades. Raymond Pearl formalized this into the "rate of living" hypothesis in the 1920s, and Denham Harman later supplied a mechanism: metabolism produces free radicals, free radicals damage cells, and a faster metabolism means faster-accumulating damage. [1]

It's a tidy theory, which is usually the first sign to check it carefully. When researchers did, much of it came apart. A 2007 Harvard Medical School study directly tested whether metabolic rate predicts lifespan across species and found that, at least among warm-blooded animals, it doesn't.[2] The free radical piece took a further hit from an even simpler experiment: if the theory were right, feeding lab animals antioxidants to mop up free radicals should extend their lives; across repeated studies, it generally hasn't.[3] Bats and many birds complicate the pattern from the other direction entirely — small bodies, fast metabolisms, and lifespans that dwarf similarly sized mammals with slower metabolic rates. The theory hasn't vanished from textbooks, but it's now treated as one contributing factor among several, not the master key it was once sold as.

Tortoises turn out to be a particularly poor mascot for the "just don't move" version of this idea, because the actual research on why they live so long points almost entirely somewhere else. Genome sequencing of Lonesome George, the last of his tortoise subspecies, found giant tortoises carry extra copies of tumor-suppressor genes, unusually efficient DNA-repair machinery, and telomeres — the protective caps on chromosomes — that barely shorten with age.[4] Many tortoise and turtle species show something called negligible senescence: past adulthood, their odds of dying in any given year simply stop climbing, which isn't true of

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[1] "Rate-of-Living Theory." *Wikipedia*.

[2] "Metabolic Rate Is Not Associated with Longevity." Senescence.info, reporting on de Magalhaes et al., Journal of Gerontology: Biological Sciences (Harvard Medical School, 2007).

[3] "A Midlife Crisis for the Mitochondrial Free Radical Theory of Aging." *PMC*, National Center for Biotechnology Information.

[4] "In Death, Lonesome George Reveals Why Giant Tortoises Live So Long." *ScienceDaily*, reporting on a Yale University/University of Oviedo/Galápagos Conservancy study in *Nature Ecology & Evolution*.

humans, or of most animals, at any activity level. Their famously slow heart rate (as low as 10 beats a minute in a giant tortoise) is part of the picture, but it sits inside a cold-blooded metabolic system that doesn't generate its own body heat the way a mammal's does in the first place — a genuinely different chassis, not a lower setting on the same one.[1] Even in its heyday, the rate-of-living theory was built entirely on comparisons *between* species; it was never a claim that one mouse could outlive another mouse by moving less. Applying it to a single human deciding whether to take a walk stretches a shaky cross-species correlation into a claim it was never built to make.

Which is worth checking directly, because the actual human data runs in the flatly opposite direction. Pooled analyses covering hundreds of thousands of adults consistently find regular physical activity associated with a 20 to 35% lower risk of dying in any given year.[2] A systematic review of life-expectancy studies found regular exercisers gaining somewhere between roughly half a year and several years of life compared with inactive people, even after accounting for other health differences. Every major population study on the subject points the same direction humans have actually been measured moving in, not the direction a century-old theory about mice and elephants would predict for them. [3]

HIIT and the Afterburn Myth

High-intensity interval training's marketing rests on one real phenomenon stretched well past its actual size. After a hard interval session, your body does keep burning extra calories during recovery — excess post-exercise oxygen consumption, or EPOC, the so-called "afterburn."[4] It's real. It is also, per one frequently cited head-to-head comparison, worth about 50 to 65 extra calories, translating to a fat-loss difference measured in single-digit grams a day — "less than the weight of one restaurant butter pat," as one review memorably put it.[5] One post-workout smoothie erases weeks of that advantage. In the same comparison, total calories burned during and after the session were actually *highest* for ordinary steady-state cardio, not HIIT.[6] HIIT's real, well-supported advantage isn't the afterburn — it's time efficiency: short, hard interval protocols have been shown to produce aerobic and metabolic adaptations comparable to much

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[1] "Why Do Tortoises Live So Long? The Science Explained." ScienceInsights.
[2] "Leisure Time Physical Activity of Moderate to Vigorous Intensity and Mortality: A Large Pooled Cohort Analysis." *PLOS Medicine*.
[3] "Does Physical Activity Increase Life Expectancy? A Review of the Literature." *PMC*, National Center for Biotechnology Information.
[4] "HIIT vs Steady-State Cardio: Which Is Best for You?" Naked Nutrition.
[5] "HIIT Afterburn for Fat Loss: 29 Trials Measured a 5-Gram Difference." FitChef.
[6] "HIIT and the Afterburn Effect: Myth or Fact?" MuscleEvo.

longer sessions of moderate training.[1] That's a genuinely useful trade for a busy week. It's a different claim than "HIIT torches fat for 24 hours," which is the one that actually sells the app.

The Walk That Actually Works

Here's one popular claim that holds up better than most: a short walk after eating measurably blunts the blood sugar spike that follows a meal. A randomized crossover trial found a 10-minute walk taken immediately after eating produced a significantly lower glucose peak than sitting still — and, in the same study, a single 30-minute walk done later in the day did not match it.[2] A separate finding, out of New Zealand, showed that splitting a day's walking into short bouts right after each meal controlled blood sugar better than one continuous 30-minute walk at an arbitrary time, despite identical total minutes.[3] The mechanism is refreshingly unmysterious: working muscle pulls glucose out of the bloodstream through a pathway that doesn't even need insulin to work, right at the moment blood sugar is climbing. Timing, in this one specific case, genuinely does matter more than total volume — the opposite lesson from the cardio section above, and a good reminder that the honest answer to "does timing matter" is "it depends which question you're actually asking."

Yoga's Real Benefits (and Its Blind Spot)

Yoga has a real, growing, NIH-reviewed evidence base: meaningful gains in flexibility and balance, modest reductions in blood pressure and abdominal obesity, improvements in low-back pain, and mental health benefits that show up across dozens of trials.[4] One study of previously untrained adults found 10–30% strength gains and 13–188% flexibility gains at various joints after eight weeks of practice.[5] None of that is nothing.

There's a genuine methodological wrinkle worth knowing, though, and it's a clever one: unlike a drug trial, yoga research has struggled to build a convincing placebo. Researchers have only recently started developing "sham" yoga poses specifically to test whether the benefit comes from the postures themselves or from the expectation that comes bundled with doing something branded as yoga.[6] That's not a reason to dismiss the real findings above — flexibility and balance gains are measured, physical, and hard to fake with belief alone. It's a reason to

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[1] "HIIT vs. Steady-State Cardio: What the Evidence Shows." Forward Family Medicine.
[2] "Positive Impact of a 10-min Walk Immediately After Glucose Intake on Postprandial Glucose Levels." *PMC*, National Center for Biotechnology Information.
[3] "Walking After Meals: Small Habit, Big Metabolic Gains." News-Medical.
[4] "Yoga: Effectiveness and Safety." National Center for Complementary and Integrative Health (NCCIH), NIH.
[5] "Yoga: Modern Research Shows a Variety of Benefits to Both Body and Mind from the Ancient Practice." The Conversation.
[6] "Development of Sham Yoga Poses to Assess the Benefits of Yoga in Future Randomized Controlled Trial Studies." *PMC*, National Center for Biotechnology Information.

hold the softer claims (mood, stress, "energy") a little more loosely than the harder, more mechanical ones.

Tai Chi and the Falling Problem

Tai chi's best-supported claim is narrow and unglamorous, and it happens to be true: it reduces falls in older adults. A meta-analysis of 24 randomized trials found tai chi cut fall risk by roughly a quarter, with the effect holding up for both healthy older adults and those already at elevated risk.[1] The NIH's own complementary-medicine center puts a specific number on it — about a 19% reduction in the rate of falls, based on seven trials and more than 2,600 participants.[2] Not every outcome researchers have tested comes back positive, and some individual trials have found no significant effect at all, which is part of why this gets filed as "moderate confidence" rather than "settled" — but for an ancient martial art whose modern claims mostly involve words like "energy flow," the fall-prevention finding is about as solid as movement science gets.

The Cold Plunge Tease

Cold plunge sales on Amazon rose roughly ninetyfold in a single year (from under 1,000 units to more than 90,000) between late 2022 and late 2023 — a growth curve that outran the science by a wide margin.[3] The core physiology is real: cold exposure genuinely activates brown fat, a metabolically active tissue that burns energy to generate heat, and a single cold-water session can spike metabolic rate dramatically while you're actually in the water.[4] What doesn't hold up nearly as well is the leap to the outcomes people actually want. A 2025 systematic review found no good evidence that cold water immersion produces meaningful weight loss, and a Cochrane review — healthcare's gold standard for evidence quality — found only "some evidence" that cold water reduces post-exercise muscle soreness, explicitly rating the underlying study quality as low and noting most subjects were male.[5] The reviewers' own framing is hard to improve on: ice bath popularity has wildly outpaced the evidence behind many of its claimed benefits.[6] Real mechanism, thin proof for the specific promise on the label — the same shape as sleeping naked, three chapters back.

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[1] "Tai Chi for Fall Prevention and Balance Improvement in Older Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials." *PMC*.
[2] "Tai Chi: What You Need To Know." NCCIH, NIH.
[3] "Effects of Cold-Water Immersion on Health and Wellbeing: A Systematic Review and Meta-Analysis." *PLOS One*.
[4] "Health Benefits of Cold Water Immersion, Ice Baths & Cold Showers." Stem Cell Thailand.
[5] "Cold Water Immersion: Can It Benefit Health?" ZOE.
[6] "Effects of Cold-Water Immersion on Health and Wellbeing: A Systematic Review and Meta-Analysis." *PLOS One*.

The Sauna Exception

If cold exposure is the overhyped sibling, heat exposure might be the one case in this whole book where the wellness-world claim is roughly as strong as advertised. A long-running Finnish cohort study of more than 2,300 middle-aged men found that going 4 to 7 times a week, for sessions of 19 minutes or longer, was associated with roughly half the risk of fatal cardiovascular events compared with once-weekly use — a genuine dose-response relationship, replicated across multiple outcomes including all-cause mortality, stroke, and dementia.[1] The honest caveats matter, though: this is observational cohort data, not a randomized trial, so it can't fully rule out that healthier people simply sauna more often in the first place; the results are specific to Finnish-style dry heat and to a population that was, almost without exception, male; and researchers have explicitly said the findings shouldn't be assumed to transfer to steam rooms or hot tubs.[2] Real, replicated, dose-dependent — with an asterisk about who exactly it's been proven for.

Extended Fasting's Surprise Twist

Multi-day water fasting is often sold as a "metabolic reset" that triggers autophagy, the cell's internal cleanup process. The autophagy link is well established in animal studies; in humans, the evidence is considerably thinner.[3] The genuinely surprising finding comes from a rigorous 2025 proteomics study of a 10-day supervised water-only fast: rather than the hoped-for drop in inflammation, researchers found a significant *increase* in inflammatory signaling — the opposite of their own hypothesis — with fewer than 1% of the affected proteins still altered after refeeding, suggesting most of the change is temporary rather than a lasting "reset."[4] A separate, longer trial did find some cardiometabolic markers still improved at six weeks, so the picture isn't uniformly negative — but it is genuinely mixed, not the clean win the marketing implies.[5] The documented risks are also real and worth taking seriously: electrolyte imbalance, muscle loss, and refeeding syndrome, which is why every medically supervised protocol insists on reintroducing food as slowly as the fast itself.[6] This is one extended-hardship practice that hasn't earned the confidence people extend to it.

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[1] "Sauna Use as a Lifestyle Practice to Extend Healthspan." ScienceDirect.

[2] "Sauna Use Linked to Longer Life, Fewer Fatal Heart Problems." Harvard Health.

[3] "Fasting and Autophagy: Is It Actually Effective for Health and Longevity?" Healthy Male. https://healthymale.org.au/health-article/fasting-and-autophagy-for-health-and-longevity.

[4] "Prolonged Fasting Promotes Systemic Inflammation and Platelet Activation in Humans: A Medically Supervised, Water-Only Fasting and Refeeding Study." *PMC*, National Center for Biotechnology Information.

[5] "A Six-Week Follow-Up Study on the Sustained Effects of Prolonged Water-Only Fasting and Refeeding on Markers of Cardiometabolic Risk." *PMC*, National Center for Biotechnology Information.

[6] "The Effects of Prolonged Water-Only Fasting and Refeeding on Markers of Cardiometabolic Risk." *PMC*, National Center for Biotechnology Information.

The Pills That Don't Boost Anything

Which brings us to the supplement aisle's most durable promise: your immune system can be "boosted" with the right pill, and vitamin C, D, and zinc are usually the ones doing the selling.

The individual nutrients genuinely matter — real deficiencies in any of the three measurably impair immune function, and correcting an actual deficiency helps.[1] The leap from there to "so more, for someone who isn't deficient, helps further" is where the evidence runs out. A meta-analysis of randomized controlled trials — the strongest evidence available, not just observational correlation — found multivitamin-mineral supplementation had no significant effect on all-cause mortality at all.[2] A twelve-week, placebo-controlled trial in healthy older adults given a multivitamin specifically formulated to support immunity found exactly what that framing should predict and didn't: blood levels of vitamin C and zinc went up, self-reported health went up, and actual measured immune function — bacterial killing activity, immune cell response — didn't budge. The subjective number moved. The one that was supposed to matter didn't.[3] One separate trial even found a hint of the opposite: vitamin E supplementation in older adults showed no benefit for preventing respiratory infections and a suggestion of added risk.[4] "There is no evidence that mega-doses of vitamins and nutrients can boost the immune system" is about as flat a sentence as nutrition science produces, and it's the one the research actually supports — even as the vitamin aisle keeps growing.[5] For the roughly two billion people worldwide with a genuine deficiency, supplementation is real medicine. For an already-adequate immune system, another capsule is a subjective boost with no objective one attached — the same split, once again, between the number that moved and the one that mattered.

The Practice

Line these seven up and a shape appears.

The genuinely well-supported practices in this chapter — walking after meals, tai chi for balance, moderate frequent sauna use, hitting a weekly volume target however you like — are almost all modest, unglamorous, and hard to sell as a transformation.

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[1] "Dietary Supplements for Immune Function and Infectious Diseases." NIH Office of Dietary Supplements.

[2] "Multivitamin-Multimineral Supplementation and Mortality: A Meta-Analysis of Randomized Controlled Trials." ScienceDirect.

[3] "The Effect of a Multivitamin and Mineral Supplement on Immune Function in Healthy Older Adults: A Double-Blind, Randomized, Controlled Trial." PMC.

[4] "Dietary Supplements for Immune Function and Infectious Diseases." NIH Office of Dietary Supplements (vitamin E sub-analysis).

[5] "Do Supplements Really Benefit the Immune System?" Medical News Today.

The overclaimed ones — HIIT's afterburn, the cold plunge, the extended fast — tend to share a real underlying mechanism dressed up several sizes too big for the specific promise resting on top of it. None of that means skip the cold plunge or the multi-day fast if you enjoy them; it means knowing which specific claim about them has actually been tested, and which one is just riding along on the vocabulary of the one that has.

Chapter 6. The Vice Ledger

> "We are what we repeatedly do. Excellence, then, is not an act, but a habit." [1]
> — *Will Durant, summarizing Aristotle, The Story of Philosophy, 1926*
>
> "Quitting smoking is easy. I've done it a thousand times." [2]
> — *Widely attributed to Mark Twain*

Every era decides that some substance or habit is either medicine or poison — rarely both at once, and rarely for very long. Underneath all of them sits something more stubborn: the pull people call addiction, a knot tied into the most fragile part of being human. This chapter doesn't promise to untie it. But it can help you see the knot clearly enough to stay further away from it — and along the way, it asks the harder question of whether indulging any of this was ever going to make anyone happy in the first place, and what the pills sold as protection from all of it actually protect.

What Is Addiction?

Before getting into specifics, it's worth pinning down what "addiction" actually means. In everyday speech, the word gets attached to almost anything a person likes a little too much and can't stop doing — "I'm addicted to bubble tea," "I'm addicted to this show." Clinically, addiction isn't just enthusiasm turned up loud. It's a specific, recognizable cluster of symptoms:

- The activity gradually takes over more and more of a person's thinking and daily life (**salience**).
- It takes a bigger dose, or more time, to get the same effect it used to (**tolerance**).
- Stopping produces real physical or psychological distress (**withdrawal**).
- Repeated attempts to cut back or quit keep failing (loss of control, sometimes called **impaired mood regulation**).
- The person keeps going even while knowing it's causing real harm (**conflict**).
- Even after years of abstinence, a single re-exposure can snap the person almost instantly back to where they left off (**relapse**).

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[1] Durant, Will. The Story of Philosophy: The Lives and Opinions of the Greater Philosophers. New York: Simon & Schuster, 1926.

[2] Widely attributed to Mark Twain in popular quotation collections (e.g., Goodreads, and "Quitting Smoking Is Easy...Mark Twain Said So," Journal of PeriAnesthesia Nursing, 2009); no primary source confirmed.

This framework was built around alcohol and drugs, but what it actually describes is a general psychological mechanism, not a chemical reaction specific to any one substance.

The single most important, and most commonly misunderstood, piece of that mechanism comes from one of the few genuinely useful discoveries neuroscience has produced in the last three decades: the brain treats "**wanting**" something and "**liking**" it as two separable processes, run by two different circuits — a finding credited to researchers Kent Berridge and Terry Robinson.[1]

"**Wanting**" — craving, anticipation, the motivational pull toward a reward — runs largely on the dopamine system, which gets described, inaccurately, as the brain's "pleasure chemical" more often than any other piece of neuroscience makes it into casual conversation. "**Liking**" — the actual, in-the-moment pleasurable sensation — depends on a much smaller and more fragile set of circuits, concentrated in specific "hedonic hotspots," running on opioid signaling, not dopamine.

Berridge's own lab states the finding plainly: dopamine appears to mediate wanting, not pleasure itself. Suppress dopamine in a person or an animal and their enjoyment of a good meal barely changes — even as their motivation to go get one collapses entirely. [2]

Addictive substances and addictive behaviors both exploit exactly that gap. They massively amplify the dopamine "wanting" system, and with repeated exposure, that system becomes progressively sensitized — overreacting, throwing off intense cravings at the smallest possible cue — while the "liking" system, the part that's actually supposed to enjoy the experience, typically stays flat or even declines. This is the more honest, and considerably colder, truth about addiction: it was never a story about something making a person steadily happier. It's the wanting system getting rewired to keep demanding the same thing indefinitely, long after the liking system has stopped being especially interested in it — which is also, on a much smaller and more mundane scale, why a phone notification can feel urgently necessary to check and then genuinely unsatisfying two seconds later. [3]

What Can Become Addictive?

Since addiction, at bottom, is a story about a wanting system getting hijacked rather than a chemical reaction unique to any one substance, in principle almost anything capable of reliably

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[1] Berridge, Kent C., and Terry E. Robinson. "Liking, Wanting, and the Incentive-Sensitization Theory of Addiction"; and Berridge, K. C., & Robinson, T. E. (1998). "What Is the Role of Dopamine in Reward: Hedonic Impact, Reward Learning, or Incentive Salience?" Brain Research Reviews 28, no. 3: 309–369.

[2] "Neuroscience of Liking and Wanting." Berridge Lab, University of Michigan.

[3] *Same as* [1]

triggering that reward circuitry, with dense enough feedback, can get hijacked the same way — not just drugs.

The best-documented non-drug addictions fall under the heading of "behavioral addiction." The American Psychiatric Association's DSM-5 currently recognizes exactly one behavioral addiction outright: pathological gambling. Video game addiction sits on a waiting list of its own, filed as a "condition for further study," not yet promoted to a full diagnosis. [1] The World Health Organization's ICD-11 is somewhat bolder, formally classifying both under "disorders due to addictive behaviors" — though even there, compulsive sexual behavior gets filed separately, under "impulse control disorders," not addiction, and the American manual doesn't include it at all. The two leading diagnostic authorities in the world can't fully agree on which behaviors count as addictions in the first place. [2]

Beyond that official list, the research literature has plenty of well-documented candidates that have never quite made it onto an official diagnostic code: compulsive shopping, compulsive social media use, exercise addiction, and — later in this chapter — one particularly unexpected example.

First, though, the oldest and least controversial category: drugs.

“Moderate” Smoke & Drink

Cigarettes need no rehabilitation in these pages — the case against them is about as settled as anything in medicine, responsible for roughly one in five deaths in the countries that smoke the most. [3] What's more interesting than "cigarettes are bad" is how long the tobacco industry has got to say otherwise using real doctors' names, and how a supposedly gentler alternative still doesn't clear the bar people assuming.

Cigars are usually sold, informally, as the reasonable middle ground — special-occasion smoking, not inhaled, surely safer. The data agrees only partway. Heavy, inhaling cigar smokers face cancer and cardiovascular risks that meet or exceed cigarette smokers'; a large prospective study found current cigar smoking associated with roughly five times the risk of fatal lung cancer and more than ten times the risk of fatal laryngeal cancer compared with never-smokers.[4] At the lighter end — one or two cigars a day, no inhalation — the picture gets genuinely murkier, but not in the reassuring direction people hope: an FDA staff review found the specific risk

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[1] "Current Advances in Behavioral Addictions: From Fundamental Research to Clinical Practice." American Journal of Psychiatry.

[2] Reed, G. M., et al. "Emerging Experience with Selected New Categories in the ICD-11." World Psychiatry (2022).

[3] Global tobacco mortality statistics, WHO and CDC surveillance data.

[4] "Cigar Smoking in Men and Risk of Death From Tobacco-Related Cancers." *JNCI: Journal of the National Cancer Institute*.

estimates at that exposure level too statistically noisy to draw a confident conclusion from, [1] built on a small enough number of actual cancer deaths in the underlying studies that "not proven harmful" and "not enough data yet" are doing the same job. That's a different claim than "safe," and every major cancer center still declines to make it.[2] [3]

Alcohol is the far more interesting reversal, because for decades the establishment position and the contrarian one was exactly backward from where this book usually finds them: the "moderate drinking protects your heart" story was the mainstream one, repeated by cardiologists, and it's the one now under the most serious strain. The famous J-shaped curve — moderate drinkers outliving both abstainers and heavy drinkers — showed up in study after study for a real, boring statistical reason: many "non-drinkers" in these cohorts were former drinkers who'd quit because they were already sick, a bias with an actual name, the "sick-quitter effect."[4] Compare moderate drinkers only against people who never drank at all, rather than against a category quietly stuffed with the already-ill, and much of the apparent protection gets harder to find.

The cleanest test anyone could have run was cut short. In 2018, the National Institutes of Health launched the Moderate Alcohol and Cardiovascular Health Trial, a genuine $100 million randomized controlled trial designed to finally settle the question. It was shut down after just 105 of a planned 7,800 participants had enrolled, following reporting that revealed the alcohol industry had been involved in shaping the study's design and courting its investigators — the same shape of story as the sugar industry's fingerprints on fat research, a few chapters back, with a different substance and a bigger number attached.[5] [6] In its absence, researchers have leaned on Mendelian randomization — the genetics-as-natural-experiment method that, in an earlier chapter, was the strongest evidence *for* cholesterol's role in heart disease. Applied here, it points the other way: a 2024 study across more than 30,000 matched cases in the Million Veteran Program replicated the familiar U-shaped pattern in the observational data, then found no such protective effect once genetic variants stood in for actual drinking.[7] The method that vindicated one health claim in this book undercuts another. That's what taking a method seriously actually looks like.

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[1] "FDA Study: Cancer Risks Nearly Nil for 1-2 Cigars per Day." R Street Institute.
[2] "Cigar Smoking: Safer Than Cigarette Smoking?" Mayo Clinic.
[3] "Are Cigars Bad for You?" MD Anderson.
[4] "Benefits and Risks of Moderate Alcohol Consumption on Cardiovascular Disease: Current Findings and Controversies." *PMC*, National Center for Biotechnology Information.
[5] "A Major Industry-Funded Alcohol Study Was Compromised. How Many Others Are Out There?" Undark.
[6] "NIH to End Funding for Moderate Alcohol and Cardiovascular Health Trial." National Institutes of Health.
[7] "A Mendelian Randomization Study of Alcohol Use and Cardiometabolic Disease Risk in a Multi-Ancestry Population from the Million Veteran Program."

Coca-Cola, Named After

It's tempting to assume large-scale drug commerce is a modern, criminal-underworld phenomenon. Some of history's most consequential drug dealers were a government, a celebrated Viennese neurologist, and a soft drink.

Cocaine's early history runs through the era's most respectable people rather than its least. Vin Mariani, a Bordeaux wine infused with coca leaf extract, launched in France in the 1860s with a customer list resembling a state dinner guest list: Pope Leo XIII carried a personal flask and awarded its creator a medal, and Queen Victoria, Thomas Edison, and Jules Verne all reportedly drank it.[1] In Atlanta, a pharmacist and Civil War veteran named John Pemberton — himself addicted to morphine and searching for a cure — built an American answer to Vin Mariani, then reformulated it into a non-alcoholic version in 1886 when local prohibition hit: **Coca-Cola**, marketed as "the temperance drink" and, per its own advertising, a genuine cognitive enhancer.[2] Sigmund Freud was cocaine's most enthusiastic scientific champion, publishing an 1884 paper amounting to a love letter to the drug, using it himself, and recommending it — fatefully — to a close friend as a cure for morphine addiction; that friend combined the two and died. [3] Cocaine wasn't quietly removed from Coca-Cola's recipe until around 1903, and by the century's turn it had been marketed, entirely legally, in tonics, wine, and toothache drops for children.[4]

Opium War

Britain's **opium** trade with China is one of the starkest examples on record of a state treating mass addiction as trade policy. By the early 1800s, Britain was buying enormous quantities of Chinese tea, silk, and porcelain, and China would accept nothing but silver in return, steadily draining British reserves. The British East India Company's fix was to build a monopoly on opium cultivation in Bengal and sell the finished product into China — illegally, since China had banned opium repeatedly since 1729, through a deliberately maintained network of private merchants and Chinese smugglers who kept the supply moving regardless. It worked, in the narrowest commercial sense: opium exports to China grew roughly a hundred-and-fifty-fold between 1729 and the 1830s, solving Britain's trade deficit by manufacturing a nationwide addiction crisis on the other end of it. When China's government finally tried to enforce its own ban by destroying British opium stockpiles in 1839, Britain went to war over it. Twice. Both the First Opium War (1839–1842) and the Second (1856–1860) ended in Chinese defeat, forcibly reopening and eventually fully legalizing the trade, and ceding Hong Kong to Britain — a European empire that

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[1] "The History of Cocaine." FibonacciMD.
[2] "Coca-Cola's Creator Said the Drink Would Make You Smarter." Smithsonian Magazine.
[3] "Freud's Studies on Cocaine and Their Role in Early Psychiatry."
[4] "The History of Cocaine in the United States." Recovery.com.

fought, and won, a war specifically to keep selling an addictive drug into a country that had asked it to stop. [1] [2]

Fentanyl, New Wave

Fentanyl splits cleanly into a legitimate half and an illicit one, and the business logic driving the illicit half is worth understanding precisely because it's so mundane. Belgian chemist Paul Janssen synthesized fentanyl in 1959 while deliberately searching for a faster, more potent painkiller than surgeons had available; the result was somewhere between 50 and 100 times more potent than morphine, genuinely useful for controlled anesthesia, and it remains legitimate medicine today.[3] The crisis is a separate, more recent story, shaped earlier by the aggressive prescription marketing of drugs like OxyContin in the late 1990s, which built the population of people already dependent on opioids that illicit fentanyl later moved in to supply. Since 2013, illicit fentanyl — increasingly mixed into heroin, cocaine, methamphetamine, and counterfeit prescription pills, often without the buyer's knowledge — has driven what the CDC calls the third wave of the opioid crisis, and is now responsible for tens of thousands of American deaths every year.[4]

The economics driving that illicit half are stark enough to be worth sitting with: because fentanyl is so much more potent by weight, the same money that buys roughly $80,000 worth of heroin can be converted into something closer to $1.6 million worth of fentanyl once cut into the supply — a gap large enough to make fentanyl's takeover of the illicit opioid market close to inevitable once the chemistry and supply chains existed, independent of any single company's marketing. A gap that size, and the political weight riding on it, makes it easy to imagine larger, state-level actors sitting somewhere upstream in the supply chain. That's a bigger question than this book is trying to answer, and not the one it's set out to.[5]

The Spectrum of Behavioral Addiction

With *substance addiction* covered, it's worth returning to *behavior addiction*. [6] **Pathological gambling** is the only behavioral addiction formally recognized as an addiction by both the DSM-5 and the ICD-11 — and it only won that status recently. When the DSM-5 was published in

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[1] "Opium Wars." *Wikipedia*.
[2] "How Opium Became a Pillar of the British Empire." D+C – Development + Cooperation.
[3] "Who Made Fentanyl? Origins and the Modern Crisis." LegalClarity.
[4] "Fentanyl: A Timeline of a Synthetic Drug." Esy.
[5] "Origins of the Fentanyl Crisis - Part 1."
[6] "Current Advances in Behavioral Addictions: From Fundamental Research to Clinical Practice." American Journal of Psychiatry.

2013, it justified the reclassification by pointing to a substantial body of evidence that gambling activates the same brain circuitry as substance addiction.

Slot machines are close to a textbook application of that circuitry. They run on what's called variable ratio reinforcement — there's no way to predict when the next payout is coming, and that unpredictability itself is what most powerfully triggers dopamine release. Even more calculated is the "near-miss" effect: the moment the reels almost line up on the jackpot symbol then fall one slot short, it activates nearly the same brain circuitry as an actual win. Research shows slot machine reel weighting can be deliberately engineered for this — by adjusting the odds of a near-miss symbol landing next to the payline, manufacturers can artificially inflate how often players experience that "I was so close" feeling, keeping them feeding in the next coin.[1]

😎 *It's worth trying a small substitution exercise with that last paragraph: swap "slot machine" for "stock market," and see how it reads.*

Other familiar compulsive behaviors sit in a more contested category — **pyromania** and **kleptomania**, for instance, are currently classified as "impulse control disorders," a different clinical bucket than "addiction," even though they share some of the same loss-of-control signature.[2]

Video game addiction occupies an awkward position: the WHO has formally placed it in the ICD-11 under "disorders due to addictive behaviors," but the American Psychiatric Association still keeps "internet gaming disorder" on the DSM-5's waiting list, not a real diagnosis.[3] And the design element that borrows most directly from the casino floor is the loot box: paying real money for a box with randomized contents, where the odds of pulling a genuinely rare item are vanishingly low — but the opening animation itself flashes a rapid sequence of rare-looking items across the screen before settling on an ordinary one. That's the exact same "near-miss" logic as a slot machine's reels, wearing a different skin. Once those randomized items can themselves be resold for real money on secondary markets, the mechanic stops being a metaphor for gambling and simply becomes gambling, wearing an entertainment costume.[4]

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[1] Echenique, Ryan. "The Dopamine Trap: How Gambling Hijacks..." Cognitive NeuroEconomics @ UCSD, Medium; citing Zald et al. (2004); "Dopamine Modulates Reward Expectancy During Performance of a Slot Machine Task in Rats: Evidence for a 'Near-miss' Effect." Neuropsychopharmacology; and U.S. Patent documentation on slot machine symbol-ratio weighting.

[2] Clinical classification of impulse-control disorders, DSM-5 and ICD-11.

[3] "(Internet) Gaming Disorder in DSM-5 and ICD-11: A Case of the Glass Half Empty or Half Full." Journal cited via SAGE Publications.

[4] "The Slot Machine Psyche — How Variable Ratio Reinforcement Drives Modern Gaming Engagement." PlayStation Universe.

Compulsive sexual behavior sits at the opposite extreme of official recognition: the WHO's ICD-11 does include a diagnosis for it, but files it under "impulse control disorders" — explicitly not addiction — while the American Psychiatric Association seriously considered adding it to the DSM-5 in 2013 and ultimately decided against including it at all.[1] The two diagnostic systems don't just disagree on the category here; they don't even agree that this counts as a single, unified clinical problem. None of which means the pattern itself isn't real or distressing for the people living with it — it's a caution that "addiction" isn't a label that automatically fits every compulsive, repeated behavior a person can't seem to stop.

Exercise addiction is in a more marginal spot still: it has no formal diagnostic code in either the DSM-5 or the ICD-11, but the supporting research literature is fairly substantial. Assessment tools generally check the same criteria laid out earlier in this chapter — salience, mood modification, tolerance, withdrawal, conflict, relapse. Estimated prevalence in the general population sits around 3%, but among gym regulars and elite athletes, some studies put the figure above 40%.[2] Core symptoms include genuine withdrawal reactions when forced to stop, training through injury, and relationships damaged because exercise keeps winning the competition for priority.[3]

The next is a really an unexpected entry: **tanning addiction**. Exposing skin to ultraviolet light triggers endorphin release through a genuinely roundabout pathway: UV radiation damages DNA in skin cells, which activates the p53 protein, which prompts those cells to synthesize a precursor molecule called proopiomelanocortin. That precursor gets cleaved into two separate peptides — one stimulates melanin production, which is what tans the skin, and the other is beta-endorphin, a real, honest endogenous opioid.[4]

A cleverly designed 2006 study tested directly whether this pathway could produce genuine addiction. Researchers recruited two groups — frequent tanners (8 to 15 sessions a month) and infrequent tanners (fewer than 12 sessions a year) — and had each group lie down on both a real UV tanning bed and an identical-looking bed that emitted no UV at all, then gave everyone varying doses of naltrexone, an opioid-receptor blocker normally used to trigger withdrawal symptoms in people addicted to opioids. The frequent tanners, on a moderate dose of naltrexone, showed a clear drop in preference for the real UV bed, and some of them developed classic opioid-withdrawal symptoms — nausea, restlessness. The infrequent tanners showed

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[1] "What Should Be Included in the Criteria for Compulsive Sexual Behavior Disorder?" PMC; and Reed et al., World Psychiatry (2022).

[2] "Prevalence and Correlates of Exercise Addiction in the Presence vs. Absence of Indicated Eating Disorders." Frontiers in Sports and Active Living.

[3] "The Prevalence of Exercise Addiction Symptoms in a Sample of National Level Elite Athletes." Frontiers in Sports and Active Living / PMC.

[4] "Tanorexia: The Psychodermatology of Compulsive Tanning." ScienceDirect.

none of this. In other words, the bodies of habitual tanners had developed a genuine physiological dependence on their own endorphins; the people who didn't tan regularly developed no such dependence just from lying under a light.[1]

Rat Search for a Better Cage

Which raises the harder question sitting underneath all of the above: among addictions, are actually some of them healthier than the other ones? — exercise, sex, work, ambition — simply take its place?

The single most-cited answer to that question is a 1970s rat experiment that mostly didn't hold up, and it's worth knowing that before repeating it. Psychologist Bruce Alexander housed rats either alone in standard cages or together in "Rat Park," a spacious enclosure with company, toys, and room to roam, then gave both groups access to morphine-laced water. The isolated rats drank far more; the social ones mostly ignored it. "Addiction isn't you, it's the cage you live in," Alexander concluded — a genuinely appealing idea, and the intellectual root of a lot of modern "connection is the opposite of addiction" thinking. The trouble is what happened next: a 1996 attempt to replicate the experiment precisely, down to the rat breed, found no meaningful difference between the social and isolated groups in one run and the opposite result in another. Even Alexander's own later papers acknowledge that further attempts within his own lab, using different rat strains, also failed to reproduce the original effect. The original result was real, published, peer-reviewed — and it just hasn't traveled well. Environment plausibly matters to addiction; it's less settled than the version of this story that gets forwarded around actually claims.[2]

What survives more sturdily, underneath the specific experiment, is a broader and more modest point: humans do appear to substitute one compulsive behavior for another, and that cuts both helpfully and unhelpfully. Structured exercise, sex, and demanding work can all occupy the same reward circuitry that substances do, which is part of why they show up so often in recovery programs as replacements — and also why the behavioral addictions surveyed above are genuine, if smaller, clinical categories in their own right, not just jokes about people who really love the gym. Trading one compulsion for a healthier-looking one can be a real improvement without being a cure for the underlying compulsiveness itself.

This is also why the wanting/liking split from earlier in this chapter isn't only useful for understanding addicts or gamblers. That same distinction — which system is actually running the show at a given moment — decides something much broader: whether a life ever arrives at

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[1] Burton, Adrian. "Radiation: Tanning Trippers Get UV High." Environmental Health Perspectives, via PMC (2006).

[2] "Rat Park." Wikipedia; "This 38-Year-Old Study Is Still Spreading Bad Ideas About Addiction." The Outline; "Adult, Infant, and Animal Addiction - Rat Park." Bruce K. Alexander.

genuine enjoyment or just keeps getting pushed by wanting toward the next thing, going through the motions of a craving without ever quite being present for any of it.

Self-Indulgence

Here the philosophical debate is older than the neuroscience: Aristotle drew a hard line between hedonia (pleasure-seeking) and eudaimonia (a life organized around meaning and purpose), arguing only the second produced anything durable.[1] Modern positive psychology has largely, if imperfectly, confirmed the durability half of that claim. Pleasure fades on a predictable schedule researchers call hedonic adaptation — the new car, the raise, the vacation, each delivering a burst of satisfaction that settles back toward baseline within months, driving people to chase a bigger version of the same hit rather than a lasting one.[2] Meaning-oriented pursuits show up in study after study as more stable and less prone to that fade.[3]

Both wanting and liking, notice, deliver real pleasure. The first is sharp, short, and prone to tolerance; the second is calmer, slower, and considerably less predictable about when it shows up or fades. It isn't hard to see why: a wanting system habituates to whatever's familiar, so once a goal is reached, the payoff is gone almost as fast as it arrived, and reaching the same high again requires a new, bigger target. Addiction, looked at this way, is simply what happens when that same wanting system gets reset to a higher target over and over, with no exit built in.

A self-indulgent life, in the sense the old philosophers actually worried about, isn't really organized around pleasure at all. It's organized around wanting — the next purchase, the next scroll, the next drink, the next plate, reached for precisely because the last one stopped delivering its "liking" payoff almost as soon as it arrived. It's a short, easy slide from there into one compulsion stacked on another.

None of which is a reason to stigmatize pleasure itself. It's worth resisting the tidier moral that pure pleasure is simply the lesser, emptier path, because plenty of people are eager to make exactly that case with more confidence than the evidence supports.[4] Hedonic experience gets dismissed in both scholarship and casual conversation as "selfish, self-indulgent, shallow" almost by reflex — and the actual data doesn't support treating it as a lesser form of the same thing. The two aren't really competitors on the same scale; a good meal, a real vacation, an afternoon of pure fun serve emotional regulation and restoration in their own right, and the most consistent finding across the literature is that people who report both frequent pleasure

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[1] Aristotle, Nicomachean Ethics.

[2] "What Is Happiness? Hedonic & Eudaimonic Happiness Explained."

[3] "From Happiness Orientations to Work Performance: The Mediating Role of Hedonic and Eudaimonic Experiences." PMC.

[4] "What Role Does Pleasure Play in Happiness?" Greater Good Magazine, Todd Kashdan and Robert Biswas-Diener.

and a sense of meaning score higher on wellbeing than people chasing either one alone.[1] The failure mode was never pleasure itself. It's outsourcing all of it to wanting, and never actually arriving anywhere to like.

Which brings the distinction fully into view. **Wanting** is driven by **desire**, aimed at a specific, reachable goal, and the instant that goal lands, its pleasure arrives and departs on the same gust of wind. When a goal is too easy to reach, people naturally chase the same hit again and again, and the body's answer is tolerance — raising the bar a little higher each time. It's an arms race with no ceiling, and once someone finds a way to hack straight past the raised bar, addiction is the predictable result. Substance addiction is the cleanest illustration of the hack: simply raise the dose, right up until the body can't absorb any more. Behavioral addiction is a messier fight, because there's rarely a dose to raise in quite the same way.

Liking, or the deeper, slower version of it worth calling **devotion**, is aimed at something further off — a hope, an ideal, a version of the future with no clearly marked finish line. It runs on real emotional weather, genuine highs and genuine lows, and it's what keeps a person quietly asking, over and over, what any of this is actually for. It's a more durable, more internal, harder-to-name state than wanting's sharp little hits. When it goes wrong, a person can become anxious or low, and the people around them sometimes conclude, not always fairly, that he's simply lost touch with what's real. A persistent low mood is called *depression*.

Looked at from the outside, both the *addiction* and the *depression* can be read as versions of the same underlying imbalance, tipped in opposite directions between wanting and liking. Treating substance addiction, in the clinical world, is largely an exercise in trying to restore that balance — and there's real trial data now behind at least one specific, teachable way to tilt the ratio back toward the liking side: deliberately attending to, prolonging, and appreciating a pleasurable experience while it's still happening, instead of already reaching for the next one. Psychologists call it **savoring**.

It sounds almost too simple to test, and researchers have tested it anyway: randomized studies find savoring interventions produce real, measurable increases in positive emotion, with effects comparable in size to other established positive-psychology techniques and lasting as long as three to six months out. One version, "savoring the moment," outperformed both a no-treatment control and an intervention built around savoring old memories — the present-tense version of paying attention does more than the nostalgic one.[2]

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[1] "Training for Happiness: The Impacts of Different Positive Exercises on Hedonism and Eudaemonia." PMC.

[2] "Savoring Interventions Increase Positive Emotions After a Social-Evaluative Hassle." Frontiers in Psychology / PMC.

Here's where this chapter's separate threads actually knot together. The same technique — trained, deliberate attention to a natural reward, held there instead of rushing past it — is the working mechanism behind Mindfulness-Oriented Recovery Enhancement, a real clinical program tested on people whose liking systems had been ground down by years of chronic opioid use for pain. In a randomized trial, patients who went through it showed measurably larger brain and body responses to ordinary pleasant things, and reported less anhedonia months later, than a matched group who received supportive therapy without the savoring component.[1]

The same skill that turns an ordinary Tuesday dinner into something a happiness researcher can measure is, in a harder case, the one now being used to help hand a damaged reward system back its ability to feel anything at all. Wanting is the easy system to hijack, chase, and sell. Liking was quietly capable of being satisfied the entire time — it just needed someone to stay in the room with it.

The U-Shaped Life

Zoom out from any single day, and happiness across an entire life turns out to follow its own contested arc. Economists David Blanchflower and Andrew Oswald, working from surveys covering roughly 500,000 people across dozens of countries, reported a "U-shaped" pattern: reported life satisfaction is comparatively high in early adulthood, sinks through the late thirties and forties — the well-documented crunch of career pressure, young children, and mortgage payments — and then recovers, often past its starting point, in the decades after.[2]

It's a genuinely appealing finding, and also a genuinely contested one. Most of the underlying data is cross-sectional — comparing different people of different ages at a single moment — which struggles to separate a true age effect from a cohort effect, the simple fact that people born in different decades lived through different economies and events. Studies that instead track the same people over many years have sometimes found the U-shape holds and sometimes found it vanishes entirely, and even researchers sympathetic to the finding describe its size, on a typical 0-to-10 happiness scale, as closer to a faint wobble than a dramatic curve. It also isn't universal — several large-country samples don't show it at all.[3]

Seen from far enough away, the shape of that curve isn't hard to make sense of. Everyone more or less deserves a happy childhood, and midlife is supposed to be the striving years — the one

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[1] Garland, Eric L., et al. "Mindfulness-Oriented Recovery Enhancement Remediates Anhedonia in Chronic Opioid Use by Enhancing Neurophysiological Responses During Savoring of Natural Rewards." Psychological Medicine (2023).

[2] Blanchflower, David G., and Andrew J. Oswald. "Is Well-Being U-Shaped over the Life Cycle?" Social Science & Medicine 66 (2008): 1733–1749.

[3] "What Shape Does Happiness Really Take Over the Lifespan?" Psychology Today.

stretch nature has no particular interest in making comfortable. Somewhere around twelve, a streak of rebellion gets built into most people, useful mainly for the job of separating from one's parents. In the twenties, something like the restlessness of a young Werther gets planted for a similar reason — restlessness that happens to make excellent fuel for ambition. Past fifty, with less left to meaningfully change, contentment becomes the natural, low-effort default. Whatever differences show up between generations are mostly just the ordinary tide of the times, rising and falling.

One recent analysis found the pattern breaking down altogether in the 2020s — not because older adults stopped recovering, but because reported wellbeing among people under 25 has fallen enough that the "high point" the U used to start from isn't really there anymore.[1] Each generation's own U-shaped curve probably hasn't changed underneath it all; more likely, the accelerating pace of technology and the sheer information overload of a connected world have simply cost today's young people a slice of the childhood they were owed. As with most trades, there's something gained alongside what's lost.

Treat "it gets better after the midlife dip" the way this book treats most comforting statistics: probably capturing something real for a lot of people, considerably less certain and less universal than the version that ends up on a book jacket.

Which is, in the end, the natural place to stop asking what we put into our bodies and start asking what happens inside them once we do. Desire, excitement, joy, purposefulness — the wanting that drives a craving, the liking that makes a moment worth staying in, the low mood that follows an empty pleasure, the sense of direction that makes a hard week feel worth it anyway — aren't decorations on top of physical health. They're mechanisms with their own biology, their own failure modes, and their own myths, every bit as checkable as a sleep schedule or a cooking fat.

We'll leave the rest for the next volume. Stepping outside the self, Part 2 turns to how people come to feel, connect, and understand anything at all, through their constant, unavoidable interaction with the rest of the world.

[1] "The Global Loss of the U-Shaped Curve of Happiness." Global Interdependence Center.

Epilogue to Volume One

Writing that last line, it remembers me a poem by Goethe that I memorized when I was a teenage boy, and has stayed with me through the years:

> Wide world, life so grand,
> Year after year, faith withstand —
> Ever exploring, always inventing,
> Spiral circling, and never ending.
> Loyal to the old, open to the new,
> Cheerful mind, and pure in view —
> Ah — and so,
> A little further on we go.
>
> — Goethe

Weite Welt und breites Leben,
Langer Jahre redlich Streben,
Stets geforscht und stets gegründet,
Nie geschlossen, oft gerändet,
Ältestes bewahrt mit Treue,
Freundlich aufgefasstes Neue,
Heitern Sinn und reine Zwecke:
Nun! man kommt wohl eine Strecke.

—— Johann Wolfgang von Goethe